DAKOTA STATE

dsu

UNIVERSITY

Self-Study

Mathematics Program Review

College of Arts and Sciences
Dakota State University

November 8, 2005

Table of Contents

Institutional History

Dakota State University has enjoyed a long and proud history of leadership and service since its founding in 1881 as the first teacher education institution in the Dakota Territory.

For most of its history, DSU has been identified with teacher preparation, first as a normal school and later as a four-year public college. The University has had several different names, among them Madison Normal, Eastern Normal, and General Beadle State College. The name, Dakota State College, was adopted in 1969. On July 1, 1989, Dakota State College became Dakota State University. The University title was conferred on the institution by the South Dakota Legislature in order to better reflect its purpose in the total scheme of the state's higher education system. Prospective elementary and secondary teachers continue to be educated here. To this traditional emphasis, DSU added business and traditional arts and science programs in the 1960s and two health services programs, Health Information Management and Respiratory Care, in the late 1970s.

In 1984, the South Dakota Legislature and the South Dakota Board of Regents turned to Dakota State University to educate leaders for the information age. In response, Dakota State University developed leading-edge computer/information systems degree programs. The graduates of these programs enjoy enviable status in the national marketplace. As a leader in computer and information systems programs, DSU has pioneered the application of computer technology to traditional fields of academic endeavor. This thrust has led to the development of unique degree programs in biology, English, mathematics, and physical science.

In recognition of its pioneering academic programs and outreach efforts, DSU was selected as one of the ten finalists for the 1987 G. Theodore Mitau Award. The Mitau Award is peer recognition by the nation's largest association of higher education institutions, the American Association of State Colleges and Universities, of the nation's top state colleges and universities for innovation and change.

Dakota State University has been named to Yahoo Magazine's list of the 100 most wired universities in the U.S. - ranking 12th on the list in 1998, 10th on the list in 1999, 9th on the Baccalaureate II list in 2000, and 2nd on the list of top public comprehensive colleges in the Midwest according to the annual America's Best Colleges survey results released by the US News and World Report in 2005.

Dakota State University continues to serve the needs of a changing society in its second century. In order to provide its academic programs to a broader audience, DSU has taken a step forward in distance education and offers courses and academic programs via Internet, the Governor's Electronic Classroom, the Dakota Digital Network and the newly renovated Technology Classroom Building. As society's educational needs change, Dakota State University will continue to evolve to meet these needs with education, scholarship and service

Institutional Mission Statement

Dakota State University is an institution specializing in programs in computer management, computer information systems, and other related undergraduate and graduate programs as outlined in SDCL 13-59-2.2. A special emphasis is the preparation of elementary and secondary teachers with expertise in the use of computer technology and information processing in the teaching and learning process. A secondary purpose is to offer two-year and one-year programs and short courses for application and operator training in areas authorized.

College Mission

The College of Liberal Arts and the College of Natural Sciences were merged in July, 2003. The new College of Arts and Sciences offers a variety of programs and courses leading to many successful careers. Computer technology is integrated throughout all majors. The College offers the vast majority of the general education courses that serve as a background for all degrees, including degree programs in Biology, Computer Graphic Design, English, Mathematics, Multimedia/Web Development, Physical Science, Scientific Forensic Technology 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 such as chiropractic medicine, dentistry, divinity, engineering, law, library science, medicine, medical technology, mortuary science, nursing, optometry, pharmacy, physical therapy, and veterinary science. Faculty in the arts, English, and social sciences are principally located in Beadle Hall. Math and science faculty are located in the C. Ruth Habeger Science Center. The clinical faculty in Respiratory Care are located at McKennan and Sioux Valley Hospitals in Sioux Falls.

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, Fathom The Geometer's Sketchpad and MyMathLab are the primary software packages used in mathematics courses and they are all available to be loaded onto students tablets or accessible by students anywhere at anytime from the Citrix server (accessed through the internet to share computer software).

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 will be required to have a tablet by the Fall of 07. Nearly all mathematics courses have an online presence utilizing the course management system WebCt. The intermediate algebra and basic algebra sections will utilize MyMathLab in the fall of 05 (hosted by Course Compass, supported by Blackboard). 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 date of the last institutional program review was April 1999.

Outcomes of the last mathematics program review

Dr. Richey's assessment report of the mathematics program in May of 1999 was overall very positive. The recommendations for improvement focused on two main areas: faculty and students. Workload, morale, and quantity of courses were faculty issues, while course offerings and recruitment were undergraduate issues.

Since the last review a third tenure track position has been filled in mathematics, Dr. Glenn Berman, a graph theorist was hired in 2001. Since Dr. Berman's hiring DSU has offered at least two upper level (non-education, 300 or higher) mathematics courses each semester. Furthermore, the tenure track faculty have not taught classes below College Algebra for the past two years. Andrew Shiers (instructor), Kim Jones (adjunct instructor), and Terry Ryan (adjunct instructor) have taught all of the remedial level mathematics courses (Math 101 - Intermediate Algebra and Math 021 – Basic Algebra) over that period of time giving the mathematics program stability from top to bottom in its course offerings. Everything possible has been done to decrease workload. The goal is for faculty to double up on courses to reduce the number of preps per semester and assign faculty to the same, every other year courses. For example: Dr. Palmer offers Math Modeling every other year (he has taken ownership of the course). The mathematics program has the opportunity to offer more upper level classes resulting in more students majoring and minoring in mathematics (due largely to the support of the Computer Science Program). The curriculum modification allowing a double major by computer science students through the completion of only the mathematics courses in the mathematics program requirements (four or five additional mathematics courses) has been very successful in recruiting majors. Also, students in the CS program that don't double major, can minor in mathematics by taking one additional mathematics course. The MacsTech scholarship program (NSF) rewards double majors with larger scholarships and has also contributed to the number of double majors.

Trends in the Academic Program

The report by the MAA (CUPM Curriculum Guide 2004) on undergraduate programs emphasizes students' understanding the strengths and weaknesses of the 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)

Ways trends have influenced academic programs, as well as ways trends are likely to influence programs in the future?

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 how faculty teach, but it has 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. Faculty use technology as a tool to solve and analyze problems throughout the curriculum.

All the mathematics faculty have participated in curriculum redesign grants utilizing technology. In the summer of 05, the focus was on the pre-general education courses, utilizing MyMathLab and a success center model using the framework successfully implemented at the University of Alabama.

Program limitations relative to trends (concerns related to human, financial and physical resource information)

The regularly scheduled courses offered in the Mathematics for Information Systems and Math Education programs are courses that also serve as mathematical electives in the Computer Science program (to meet the 7-10 requirement). For example, Abstract Algebra was offered for the first time in nine years in the fall of 04 primarily because it was the prerequisite for the special topics Cryptology course that was offered in the spring of 05.

Academic Programs and Curriculum

Academic degrees offered

Currently, students who are math majors in mathematics can obtain a Bachelor of Science in Mathematics for Information Systems or a Bachelor of Science in Education in Mathematics with a Computer Education minor. Majors in other programs may elect one of three mathematics minors: Applied, Business or Elementary Education. Most Computer Science students either double major in Math for Information Systems or they obtain an Applied Mathematics or a Business Mathematics minor (dependent on which course was taken to meet the Calculus program requirement).

Curricular Options

Students majoring in Mathematics for Information Systems can choose their supporting coursework and electives to obtain minors in Biology, Chemistry, Physics, Computer Science or Computer Information Systems. The math education degree has a built in computer education minor.

Comparison of the program being reviewed with other regional program

Most colleges and universities in the region offer mathematics and math education degrees. All the institutions in the South Dakota Regental 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 regental institutions because of the emphasis on the integrating computer technology and the computer science component. A math or math education major must take a minimum of 18 hours of computer science coursework. The institution's wireless mobile computing initiative has made the differences more quantifiable.

Special Strengths of the Mathematics Program

Integration of Computer Technology

All the mathematics faculty have an online presence, utilize course management systems and use computer software packages in their classrooms. The University has an unlimited site license of Fathom and The Geometer's Sketchpad so they can be installed on any University leased tablet. Maple and Stella are available anytime, anywhere using the Citrix 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. In the fall of 05, with the support of the College of Arts and Sciences, a math success center will be launched to provide students access to tutors, instructors and professors outside of the office hour and structured classroom environments. Faculty continue inviting students to interact with them, regardless of whether they are enrolled in a course.

Special Topics Courses

Faculty routinely offer Special topics 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. Below are the special topics offerings since spring of 00.

YEAR	COURSE #	COURSE TITLE	INSTRUCTOR
Spring 2000	MATH 470	An Intro to Dynamic Programming	Dr. Jeff Palmer
Spring 2000	MATH 470	Adv. Spc. Top: Intro to Mathematical Programming	Byron Hurley
Fall 2000	MATH 470	Adv. Spc. Top: Math Modeling Applications	Dr. Jeff Palmer
Fall 2000	MATH 480	Directed Studies: Mathematical Programming	Dr. Jeff Palmer
Fall 2001	MATH 470	Adv. Spc. Top: Geometry for Teachers	Dr. Rich Avery
Spring 2002	MATH 470	Actuarial Exam Study	Dr. Dwight Galster
Fall 2002	MATH 491	IS: Geometry for Teachers	Dr. Rich Avery
Spring 2004	MATH 492	Adv. Spc. Top: Geometry for Teachers	Dr. Rich Avery
Fall 2004	MATH 291	IS: Computer Apps in the NS	Dr. Rich Avery
Fall 2004	MATH 491	IS: Adv. Computer Apps in the NS	Dr. Rich Avery
Spring 2005	MATH 491	Graph Coloring, Algorithms, & Implementation	Dr. Glenn Berman
Spring 2005	MATH 492-01	Topics: Cryptology	Dr. Glenn Berman
Spring 2005	MATH 492-02	Topics: Intro to One Dimensional Real Analysis	Dr. Rich Avery
Spring 2005	MATH 492-03	Topics: Operations Research	Andrew Shiers

Undergraduate Research

The mathematics program provides students with the opportunity to complete Capstone projects (with the associated course being selected from a compiled list) 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 (Dr. Jeff 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). Rich Avery has also worked with Math Education students completing Capstone Experience projects utilizing The Geometer's Sketchpad as a key component of curriculum development.

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.

All general education mathematics courses at Dakota State University meet the following system (South Dakota Regental System) goal. The System wide general education courses and goals are available at http://www.courses.dsu.edu/gened.

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

The recommended sequence of courses in mathematics is simple because of the number of course offerings each semester. An incoming student should take Calculus I in the first fall semester (only offered in the fall) when they meet the prerequisite (placement, trigonometry or trigonometry concurrently). Then they should follow this with Calculus II in the spring. If possible, they should take Math 201, Introduction to Applied Mathematics in the freshman year. This course is designed to provide a broad background, and is sufficient as a prerequisite for most upper level mathematics courses and prepares students for their first proof based course, Discrete Mathematics. Students are advised to take Discrete Mathematics in the semester following Calculus II. Majors essentially need to take all of the math courses offered thereafter.

Math education students must follow a more defined sequence of courses in the College of Education and the first two years of mathematics coursework is essentially the same as the Math for Information Systems major. There is more flexibility with the upper level courses required for the math education major since Math 341 and Math 342 are offered every semester. A check sheet system has been developed to ensure that students carefully plan their semester schedules and graduate on schedule. The check sheet for Math Education can be found in Appendix A.

The College of Education has established standards that students, including mathematics education students, must meet to be admitted to the teacher education program. Candidates for admission must have taken a minimum of 48 credit hours and maintained at least a 2.5 cumulative grade point average. Before being approved for student teaching, students must meet additional requirements including submission of the portfolio with teaching artifacts, a 2.6 minimum GPA in their major field, and satisfactory completion (C or better) in all education courses and field experiences.

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 following is a list of the courses in mathematics currently offered at Dakota State University:

MATH 021 Basic Algebra
MATH 101 Intermediate Algebra
MATH 102 College Algebra
MATH 104 Finite Mathematics
MATH 120 Trigonometry
MATH 121 Survey of Calculus
MATH 123 Calculus I
MATH 125 Calculus II
MATH 201 Introduction to Applied Mathematics
MATH 225 Calculus III
MATH 281 Introduction to Statistics
MATH 291 Independent Study
MATH 292 Topics
MATH 315 Linear Algebra
MATH /CSC 316 Discrete Mathematics
MATH /CSC 318 Advanced Discrete Mathematics
MATH 321 Differential Equations
MATH 341 Mathematical Concepts for Teachers I
MATH 342 Mathematical Concepts for Teachers II
MATH 361 Modern Geometry
MATH 381 Introduction to Probability and Statistics
MATH 413 Abstract Algebra
MATH 418 Mathematical Modeling
MATH 471 Numerical Analysis I
MATH 475 Operations Research
MATH 491 Independent Study
MATH 492 Topics
MATH 493-593 Mathematical Workshop

MATH 498 Undergraduate Research/Scholarship

Bachelor of Science in Education in Mathematics with Computer Education Minor

Students majoring in this program develop a strong mathematical background in a mathematics core following the guidelines of the National Council of Teachers of Mathematics and the Mathematical Association of America. Graduates of this program are prepared to teach mathematics and computer science at the secondary level. These students will receive a Bachelor of Science in Mathematics Education and a minor in Computer Education. Graduates of this program will also be prepared to use the computer as a tool in both the learning and teaching of mathematics. All DSU teacher education graduates earn a K-12 Educational Technology Endorsement.

System-wide General Education Requirement*	**30**
Institutional Graduation Requirements	**11**

* Majors must take PSYC 101, MATH 123 and one of HIST 151, or HIST 152 as part of the system-wide general education requirement.
** Majors must take CIS 130 as part of the information technology requirement.

NOTE: Students should complete professional education coursework (see below) concurrently with general education and content major coursework

MATH 125	Calculus II	4
MATH 201	Intro to Applied Math	3
MATH 281	Introduction to Statistics	3
MATH 315	Linear Algebra	3
MATH 316	Discrete Mathematics	3
MATH 341	Mathematical Concepts for Teachers I	3
MATH 342	Mathematical Concepts for Teachers II	3
or		
MATH 361	Modern Geometry	3
Plus 9 credits from the following:		9
MATH 225	Calculus III	4
MATH 318	Advanced Discrete Math	3
MATH 321	Differential Equation	3
MATH 381	Intro to Probability & Statistics	3
MATH 413	Abstract Algebra I	3
MATH 418	Mathematical Modeling	3
MATH 471	Numerical Analysis I	3
MATH 475	Operations Research	3
MATH 492	Topics	1-6*
MATH 498	Undergraduate Research/Scholarship	2

* May be repeated several times provided student does not enroll in the same Special Topics course

CIS 350	Computer Hardware, Data Communications & Networking	3
CSC 150	Computer Science I	3
CSC 206	Advanced Computer Applications	3
EDFN 365	Computer-based Technology and Learning	3
EDFN 366	Teaching Using Video Conferencing	1
EDFN 465	Multimedia Web Dev. in Education	2
SCTC 203	Comp. Applications in Nat. Sciences	2
SCTC 403	Adv. Comp. Apps in Natural Sciences	2

Students must complete 30 hours of system-wide general education courses in their first 64 credit hours.
All Professional Education Courses must be completed with a "C" or better.
[1] - No grade less than a "C" must be completed prior to admission to Teacher Education
[2] - Requires field experience.

EDFN 338	Foundations of American Education[1,2]	2
EPSY 302	Educational Psychology [1,2]	3
HIST/INED 411	South Dakota Indian Studies	3
SPED 100	Intro to Persons with Exceptionalities [1,2]	2

Admission to the Teacher Education Program is required for the remaining courses. See Requirements for Admission in the College of Education section.
*Students planning to teach outside South Dakota are encouraged to take SPED 100 for 3 credits.

EDFN/SOC 475	Human Relations	3
EPSY 330	Human Growth and Development [2]	3
ENGL/SEED 450	7-12 Teaching Reading in the Content Area [2]	3

SEED 302	Secondary and Middle Level Content Methods: Math Major [2]	2
SEED 303	Secondary and Middle Level Content Methods: Computer Science Minor(Recommended)	1

Admission to Student Teaching is required for enrollment in SEED 488. See Approval for Student Teaching in College of Education section.

SEED 401 and SEED 471 are taught in a compressed format during the first four weeks of the semester and is usually taken in the same semester as student teaching.

SEED 401	Methods of Education Technology	1
SEED 471	Secondary Education Classroom Management (Recommended)	1
SEED 488	7-12 Student Teaching	10

Students planning to teach outside South Dakota are encouraged to take

HLTH 201	ATOD Prevention Education	2

Bachelor of Science in Mathematics for Information Systems

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

Institutional Graduation Requirements   11

* Majors must take MATH 123 as part of the system-wide general education requirement.
** Majors must take CSC 150 as part of the information technology requirement. The general education website http://www.courses.dsu.edu/gened/ provides additional information on the specific requirements for general education.

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

MATH 125	Calculus II	4
MATH 201	Intro to Applied Math	3
MATH 281	Introduction to Statistics	3
MATH 315	Linear Algebra	3
MATH 316	Discrete Mathematics	3
Plus 12 credits from the following:		12
MATH 225	Calculus III	4
MATH 318	Advanced Discrete Mathematics	3
MATH 321	Differential Equations	3

MATH 361	Modern Geometry	3
MATH 381	Intro to Probability & Statistics	3
MATH 413	Abstract Algebra I	3
MATH 418	Mathematical Modeling	3
MATH 471	Numerical Analysis I	3
MATH 475	Operations Research	3
MATH 492	Topics	1-6*
MATH 498	Undergraduate Research Scholarship	2

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

SCTC 203	Comp. Appl. in Nat. Science	2	
SCTC 403	Ad. Comp. Apps in Nat. Science	2	
Select 4 credits from the following:			4
BIOL 311	Ecology	4	
BIOL 371	Genetics	4	
CHEM 332	Analytical Chemistry	4	
PHYS 451	Classical Mechanics	4	

BADM 360	Organization & Mgmt.	3	
CIS 322	Structured Systems Analysis/Design	3	
CSC 250	Computer Science II	3	
CSC 260	Object Oriented Design	3	
Select 24 credits from the following:			24
ACCT 210	Principles of Accounting I	3	
BADM 321	Business Statistics II	3	
BADM 370	Marketing	3	
BADM 425	Prod and Oper Mgmt	3	
BADM 426	Inventory Control	3	
CHEM 452	Inorganic Chemistry	3	
CIS 277	OS Interfaces and Utilities	3	
CIS 325	Management Info System	3	
CIS 330	COBOL I	3	
CIS 350	Computer Hardware, Data Communications & Networking	3	
CIS 484	Database Management Systems	3	
CSC 300	Data Structures	3	
CSC 314	Assembly Language	3	
CSC 317	Comp. Org. & Architecture	3	
CSC 433	Computer Graphics	3	

CSC 456	Operating Systems	3
CSC 461	Programming Language	3
PHSI 330	Intro Quantum Mech.	2
PHSI 343	Intro Thermodynamics	2
PHSI 345	Kinetics and Equilibrium	2
PHSI 411	Intro Statistical Mech	2
PHSI 421	Adv. Comp. Methods in Phy. Science	2
PHYS 439	Solid State Physics	3

Electives

Enrollment Statistics for Course Offerings

	Academic Year					
Course	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
MATH 021	62	106	72	71	60	58
Basic Algebra	4	31	22	23	27	29
MATH 101	135	104	98	75	71	68
Intermediate Algebra	41	54	116	50	49	42
MATH 102	191	166	292	157	144	131
College Algebra	161	159	130	107	101	90
MATH 103	17	X	X	X	X	X
Liberal Arts Math	X	X	X	X	X	X
MATH 101	X	X	X	8	X	X
Finite Math	X	X	X	X	11	X
MATH 112	X	X	48	27	62	68
Quantitative Methods	X	75	80	53	83	72
MATH 120	31	26	19	24	23	34
Trigonometry	13	X	X	X	X	X
MATH 121	X	X	48	44	38	32
Survey of Calculus	X	X	43	40	X	45
MATH 123	45	47	39	35	48	29
Calculus I	30	X	X	X	X	X
MATH 138	55	96	X	X	X	X
Calculus For Business Majors	60	64	X	X	X	X
MATH 224/125	X	30	X	X	X	X
Calculus II	39	34	28	24	33	24
MATH 225	16	X	X	X	X	X
Calculus III	X	X	X	11	X	X
MATH 270	3	X	X	X	X	X
Introductory Special Topics	X	1	X	X	X	X
MATH 281	X	X	34	X	X	X

Intro to Stats	X	X	28	17	29	X
MATH 291	X	X	X	X	X	1
IS: Computer Apps in the NS	X	X	X	X	X	X
MATH 315	X	X	X	X	X	X
Linear Algebra	37	48	25	25	25	20
MATH 318	X	X	X	X	X	X
Adv. Discrete Math	X	X	8	X	33	X
MATH 321	X	X	20	X	X	X
Differential Equations	X	X	X	X	X	X
MATH 341	34	36	28	27	25	59
Math Concepts I	8	16	25	35	14	21
MATH 342	X	30	19	28	10	70
Math Concepts II	25	43	21	18	26	28
MATH 381	X	24	X	23	X	33
Probability	X	X	X	X	X	X
MATH 413	X	X	X	X	X	24
Abstract Algebra I	X	X	X	X	X	X
MATH 414	X	17	X	X	19	X
Mathematical Modeling	X	X	X	X	X	X
MATH 471	15	X	X	X	22	X
Numerical Analysis	X	X	21	X	X	X
MATH 475	X	X	X	X	X	X
Operations Research	X	X	X	13	X	X
MATH 492	10	7	6	X	X	X
Adv. Spec. Topics	11	X	5	X	6	22
Math 480	X	2	X	X	X	X
Directed Study	X	X	X	X	X	X
Math 491	X	X	X	1	X	1
Independent Study	X	X	X	X	2	2
Math 498	X	X	2	X	X	X
Capstone	X	3	X	1	X	X

Note: the first row is summer + fall enrollment and the second row is spring enrollment.

Relationships with Other Programs at Dakota State University

Most (all except the courses with an education emphasis) of the courses in the mathematics program are required or optional for students in Computer Science. The Physical Science, Biology, Scientific Forensic Technology and Elementary Education programs also support courses in the mathematics program. However, without the support of the Computer Science program the mathematics program would not exist. Below are the mathematics support courses in the computer science program.

Note: Students are encouraged to consider the requirements for a
Mathematics minor or second major when selecting courses.

MATH 121	Survey of Calculus I	4
or		
MATH 123	Calculus I*	
MATH 201	Intro to Applied Math	3
MATH 281	Intro to Statistics	3
or		
MATH 381	Intro to Probability and Statistics	
CSC/MATH 316	Discrete Mathematics	3
MATH Electives (6 hours)		6
MATH 125	Calculus II	4
MATH 315	Linear Algebra	3
MATH/CSC 318	Advanced Discrete Math	3
MATH 321	Differential Equations	3
MATH 381	Intro to Probability and Statistics	3
MATH 413	Abstract Algebra I	3
MATH 418	Mathematical Modeling	3
MATH 471	Numerical Analysis I	3
MATH 475	Operations Research	3
MATH 492	Topics	1-4

*MATH 120 prerequisite

Instructional Methodologies

The faculty utilizes a variety of instructional methods including lecture, group problems, cooperative learning, directed reading, and multimedia supplemented with computer technology. Computer use in the classroom is highly encouraged. Faculty have put a great deal of time and energy creating documents and course materials that are accessible through the Web. All of the mathematics faculty have received redesign grants through the University and/or the Governor's office. Current investigations with funding from the administration involve the use of MyMathLab, a computer based software package that provides tutorials, an interactive textbook, multimedia presentation and an online tutoring service. The goal is to get students active and engaged in their mathematics courses.

Program Enrollments and Student Placement

NUMBER OF DECLARED MAJORS FOR THE LAST 5 YEARS

Major	2000/01	2001/02	2002/03	2003/04	2004/05
Mathematics for Information Systems	16	16	17	34	37
Mathematics Education	11	13	11	12	18

Minor	2000/01	2001/02	2002/03	2003/04	2004/05
Applied and Business	15	20	17	16	8

NUMBER OF DEGREES GRANTED FOR THE LAST 5 YEARS

Program	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Math for Information Systems	1	0	1	0	0
Math for Information Systems/ Computer Science Double majors	2	3	2	8	8
Math Education	1	4	2	2	2
Program	2000/01	2001/02	2002/03	2003/04	2004/05
Math for Information Systems		2	3	7	6
Math Education	2	2	3	2	1

Employment potential and placement

Nearly 100% of students from both Math Education and Math for Information Systems 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 placement since the last mathematics program review.

Year	Location	City	ST	Major
1999	Continuing Ed @ Purdue University	West Lafayette	IN	Math for Information Systems
2001	Martin Group	Mitchell	SD	Math For Information Systems
2001	Credit Soup, Inc.	Madison	SD	Math For Information Systems
2001	Citibank	Sioux Falls	SD	Math For Information Systems

2002	Continuing Ed @ University of NE-Lincoln	Lincoln	NE	Math for Information Systems
2002	Comprehensive Software Systems	Denver	CO	Math for Information Systems
2002	Gateway	Sioux Falls	SD	Math for Information Systems
2003FA	Esurance	Sioux Falls	SD	Math for Information Systems
2004SP	BrightPlanet, Inc	Sioux Falls	SD	Math for Information Systems
2004SP	Citibank	Sioux Falls	SD	Math for Information Systems
2004SP	DSU-CRESH	Madison	SD	Math for Information Systems
2004SP	Citibank	Sioux Falls	SD	Math for Information Systems
2002	RTR High School	Tyler	MN	Mathematics Education
2003SP	Tracy School District	Tracy	MN	Mathematics Education
1999	Continuing Ed @ DSU	Madison	SD	Mathematics Education
2001	Tri-Valley School District	Colton	SD	Mathematics Education
2002	Geddes Community School District	Geddes	SD	Mathematics Education
2002	Continuing Ed @ DSU	Madison	SD	Mathematics Education
2002	Wagner School District	Wagner	SD	Mathematics Education
2003FA	Aqua Fria Union High School	Avondale	AZ	Mathematics Education
2004SP	Mitchell Middle School	Mitchell	SD	Mathematics Education

Faculty Credentials

The faculty listed below are the principal instructors in the program.

Jeffrey Palmer, Professor of Mathematics, Ph.D., Washington State University
Rich Avery, Associate Professor of Mathematics, Ph.D., University of Nebraska
Glenn Berman, Assistant Professor of Mathematics, Ph.D., Louisiana State University
Andrew Shiers, Instructor of Mathematics, J.D., Creighton University

Kim Jones, Adjunct Instructor of Mathematics, M.Ed., Stephen F. Austin State Univ.
Terry Ryan, Adjunct Instructor of Mathematics, M.S., Indiana University

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

Anticipated Changes in Staffing

In the Fall of 05 a pilot, using the success center model, of Intermediate Algebra and a redesigned Basic Algebra course will be completed. It is anticipated that this will evolve into a success center model for the remedial mathematics courses thus, creating the need for a Director of the Success Center (also the instructor of record for all remedial mathematics students).

Faculty and/or Student Research

Dr. Rich Avery conducts research on boundary value problems and fixed point theorems. He has published over twenty-five refereed manuscripts in mathematics journals and co-authored a chapter in a book on time scales. His current research focuses on boundary value problems for partial difference equations. The results of the work done with undergraduate students Jeremy Wollman and Eric Rolland (representing work they did in their capstone experience) resulted in a refereed publication on partial difference equations.

Dr. Glenn Berman conducts research in minors of directed graphs and coloring algorithms. The results of work done last year with David Konz, an undergraduate, resulted in the presentation of results at the South Dakota Academy of Sciences meetings.

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 Spring and Fall Seasonal Reports for South Dakota Bird Notes.

Andrew Shiers has been involved in mathematics education on many levels, including experiences in middle school, high school, community college ,and four-year college. Throughout these experiences, he has taught and used many teaching strategies, and has been involved in evaluating the effectiveness of such strategies. In the late 1980s and into the early 1990s, he was involved in disseminating and implementing National Council of Teachers of Mathematics math standards on the secondary level in the State of Nebraska. More recently, he has presented at Nebraska Association of Teachers of Mathematics conferences on integrating writing activities in the secondary math classroom, as well as using the Geometer's Sketchpad to introduce and explore selected math topics in the secondary classroom. Andrew Shiers has written and secured grant funding to integrate tablet technology into college algebra courses, as well as developing accompanying assessments for these courses that are administered and graded using tablet technology.

Service to Community

Dr. Avery is a member of the Institutional Effectiveness committee and is one of DSU's representatives to the Math Discipline Council which reports to the South Dakota Board of Regents. He will serve as president of the council during the next year. Dr. Avery reviews numerous manuscripts every year for mathematics journals and has written and served as Director for two funded No Child Left Behind Grants. He serves as a Supervisor for LeRoy Township of Lake County. Dr. Avery is the President Elect of the Nebraska-Southeast South Dakota section of the Mathematical Association of America.

Dr. Glenn 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 is also 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 Curriculum Committee and Graduate Council and has served on numerous institutional committees over the years. He is a member of the statewide Mathematics Discipline Council. Additionally, Dr. Palmer is a

Past President Director of the South Dakota Ornithologists' Union and serves as web master and as a member of the Rare Bird Records Committee for that organization.

Andrew Shiers has been a DSU faculty member for four years, during which time he has volunteered to serve on the Entry Level Assessment Committee, as well as proctoring exams on Assessment Day. He is a member of the Nebraska Association of Teachers of Mathematics and the South Dakota Council of Teachers of Mathematics. Additionally, he is a member of the local Knights of Columbus chapter, an international fraternal organization.

Description of Student Organizations

Many mathematics students belong to the Math and Science club. This organization provides educational opportunities for students and carries out projects which serve the university and community. The club promotes math and science education through activities highlighting pi and mole days. In the spring, the members present a chemistry magic show for area elementary students. A major outreach activity is the offering of a math and science contest for high school students each year and more recently a middle school contest.

Speakers are invited to campus from such places as the Mammoth Site in Hot Springs, SD. Each fall the club sponsors a trip to the Nobel lectures at Gustaveus Adolphus University in St. Peter, MN. About every other year, the club members travel to museums and other events in the region. In recent years, the club sponsored trips to St. Louis, Winnipeg and Denver.

Dr. Avery has brought students to the University of Nebraska-Lincoln four of the past five years for the Regional Workshop in the Mathematical Sciences to explore the possibilities of graduate school and network with area universities. In addition, Dr. Avery has taken students to the Sectional meeting of the MAA.

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. 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

Within the unit of Computing Services, the Network Services group is responsible for planning, implementing, and securing network services for campus computing resources. A variety of servers in the Server Room provides applications hosting home directories, web space, e-mail, and other central applications. The use of the Citrix server allows students access to Stella and Maple through the internet.

Working in partnership with the colleges and the institution's academic support areas, Network services develops the image of applications installed in each computing laboratory. Network Services operate a 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
    Kari Forbes-Boyte, Dean of Arts and Sciences
    Dale Droge, Math and Science Coordinator
    Ethelle Bean, Director of the Library
    Deb Gearhart, Director of E-Education Services
    Nancy Presuhn, Senior Secretary for the College of Arts and Sciences
    David Zolnowsky, Chief Information Officer
    Craig Miller, Computing Services Manager - Network Services
    Robert Dineen, Computing Technician, E – Education 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 apply for support and up to $1000 per year is available for each faculty member.

In addition there have been opportunities through the Bush Grant, Title III, e-education services and the Governor's office to apply for support during the summer months to redesign courses.

Budget for Math and Science Programs 2000 - 2005

Fiscal Year	State Funds	Local Funds	Total
2001	$38,298	$18,116	$56,414
2002	$29,180	$16,644	$45,824
2003	$30,310	$16,500	$46,810
2004	$30,310	$16,500	$46,810
2005	$30,007	$20,000	$50,007

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 Maple. At this time there are no concerns.

Facilities and Equipment

Current Facilities

The Science Center at Dakota State contains three classrooms, each with a capacity of 50 people, a 250 seat auditorium, two chemistry laboratories, one physics lecture/lab room, a computer laboratory with Pasco interfaces for the collection of data (SMART lab), and three biology laboratories. One of the biology labs is set up primarily for microbiology and other advanced courses. It has a capacity of about 25 students. The other two rooms are general purpose where mostly introductory courses are taught (capacities of 32 and 48 students). A 300 square foot greenhouse is attached to one of the general purpose labs. There are two prep rooms for biology, one of which is also used for research space. There is a small animal room adjacent to one of the prep rooms. The Science Center had one general access computer lab containing 30 fully networked PC computers which will be converted into a success/tutor center for the mornings and a classroom for the afternoons during the summer of

05. Remaining are five general access computer laboratories on campus, including one in the library, however nearly all students have their own wireless tablet pc.

Quality of the Facilities

Although the Science Center is more than 30 years old, the laboratories, classrooms and offices are well maintained and are very serviceable. There are problems with the ventilation and heating/cooling system, which are currently being addressed by the Physical Plant.

Additional Facilities Needed

No additional facilities are needed at this time. Depending on the success of the pilot and the direction of remedial mathematics at DSU, it may be necessary to remodel a room into a permanent Success Center in the near future.

Quality of Current Equipment

Faculty at Dakota State University received a new computer with a memory upgrade in the past year. 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 programs.

Assessment and Strategic Plans

Brief History of Assessment: DSU has a long history of program and student assessment at the undergraduate and graduate level. During Fall 1993, the vice president for academic affairs asked the faculty-based Assessment Coordinating Committee to develop a formal assessment plan for the institution. The faculty committee was responsible for designing the institution's three-tiered framework for assessment and took specific responsibility for general education assessment. In April 1995, the NCA reviewers expressed their confidence that DSU "... successfully demonstrated through its plan and program a deep commitment to the assessment of students' academic achievement in a serious and professional manner." The assessment plan included

- entry-level assessment to ensure appropriate course placement,
- general education / proficiency assessment to ensure that basic knowledge and skills were being provided to students and that goals set for the system-wide general education core curriculum were being met
- major field assessment to ensure that graduates were proficient in their academic discipline.

The assessment plan for the Math for Information Systems major was developed by the faculty in conjunction with DSU's Assessment Plan.

DSU's 2000 Assessment Plan: The 2000 Assessment Plan includes the original three-tiered structure with the addition of a fourth level to assess the two graduate programs. All of the policies and procedures were updated to reflect changes in the institution and its academic programs. The policy related to the Assessment Coordinating Committee can be found at http://www.departments.dsu.edu/hr/newsite/policies/041500.htm. The institution continues to use assessment data to monitor progress on institutional goals and to strengthen course content and programs. A summary of the 2000 Assessment Plan is available at http://www.departments.dsu.edu/assessment/executive_summarytoc.htm. The assessment plans for each major were reviewed and updated during 1998-2000.

DSU's Assessment Program 2000-2005: DSU continues to integrate the assessment process into the institutional culture. The faculty and administration are committed to the assessment process and to the use of assessment data to effect institutional change. The faculty-based Assessment Coordinating Committee meets regularly to review achievement of the goals set in the 2000 Assessment Plan. The Assessment Coordinating Committee meeting minutes are sent via e-mail to all faculty and staff. In addition, Assessment Updates are posted on the web to provide a brief summary of the assessment activities. Each spring, the Deans prepare a summary of the assessment results from the past year. The College of Arts and Sciences annual reports are available at http://www.departments.dsu.edu/assessment/major_field/default.htm. During the past year, the institution focused on Institutional Effectiveness and each college and functional unit developed evaluation plans for each of the strategic initiatives. Assessment of the academic programs is included in DSU's Strategic Initiative # 4, Academic Programs. Specific information is available on the intranet (DSU's password protected site) and at http://www.departments.dsu.edu/ie. More information on strategic planning can be found in the next section.

The University also developed an online academic advising site for both students and faculty. Assessment information is available on these advising sites: http://www.courses.dsu.edu/onlineadvising/

Goals and Objectives of the Mathematics Program

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

- Students will understand the methods and important concepts of the major disciplines within mathematics.
- Students will be able to apply their knowledge of mathematics to solve new and unfamiliar problems.

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.

Students will be able to communicate their knowledge and results effectively for a wide range of purposes and intended audiences.

Graduates of the program will be prepared to enter graduate school to further their career goals in mathematics or related areas.

Goal specific to the degree in Mathematics for Information Systems:

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.

Goal specific to the degree in Mathematics for Education:

Graduates will be effective teachers of mathematics at the secondary level who are well prepared to integrate the use of computers into their mathematics teaching.

Assessment of the Goals and Objectives of the Mathematics Program

Assessment of program quality and student outcomes is an important component of program enhancement in the Mathematics Program at Dakota State University. The faculty developed a plan with several assessment activities for each major that are assessed by multiple criteria. The common set of assessment measures used include course grades, national exams, graduate surveys, employer surveys and exit interviews.

Major Field Assessment Activities

The following table summarizes the type of data collected in the major field assessment plans. Each program has a specific assessment plan with goals, student learning outcomes and assessment criteria. The assessment plan for the Math for Information Systems major and the associated data tables is available at the Office of Institutional Effectiveness and Assessment website at http://www.departments.dsu.edu/assessment/major_field/default.htm. Each year, the data table is updated to include the students' test scores, employer and graduate survey data, placement statistics and other information that is used to evaluate the student learning outcomes.

Major	Type of Program	Standardized Exams	Exit Interviews	Course Grades	Placement Statistics	Graduate Survey	Employer Survey
Math for Info. Systems	4- year	X	X	X	X	X	X
Math Education	4-year	X	X	X	X	X	X

Major Field Assessment Plans

On June 24, 2003, the South Dakota Board of Education adapted administrative rules to require content and pedagogy tests for teacher certification beginning July 1, 2005. Because new teacher education graduates will not have 3 years of teaching experience by July 2005, they will be required to successfully pass the state certification exams to meet the No Child Left Behind requirements for highly qualified teachers. Therefore, teacher education students, planning to graduate in December

2003, are strongly encouraged to take the state certification content to establish their highly qualified status for possible teaching positions in South Dakota or other states. Teacher education students making application to student teach in Spring 2004 must take the state certification content exam(s). Because math for secondary education graduates will take the Praxis II exam, they will no longer take the Major Field Assessment Exam (MFAT) produced by ETS. The effect of this change on instruction for education students will be closely monitored.

Analysis and Review of the Major Field Assessment: The faculty-based Assessment Coordinating Committee is responsible for review of the general education assessment plan and the major field assessment plans. Each year, the Committee reviews the data associated with the assessment plans (e.g. employer and graduate survey results, major-field assessment test data and the proficiency test scores.) A summary of the data is available at http://www.departments.dsu.edu/assessment

The following is a brief summary of the assessment policy changes and discussions (between 2000 and 2005) that relate to the University's assessment program.

October, 2000: The Assessment Coordinating Committee (ACC) received the results of the major-field assessment review that was completed by a faculty subcommittee. Each of the colleges received specific comments on the evaluation of each of their major-field assessment plans. The Guidelines for Major-Field Assessment Review are available at http://www.departments.dsu.edu/assessment/mf_reviewguidelines.htm

During 2001 and 2002, the Committee updated the major field assessment policy. The revised policy is available at http://www.departments.dsu.edu/hr/newsite/policies/031100.htm and the Deans presented their major-field assessment results to the Assessment Coordinating Committee. Dr. Eric Johnson, presented the results of the major-field assessment activities. The Deans will include information on their general education assessment results in their annual assessment report.

During 2002: The institutional program review process was modified to incorporate assessment and strategic planning.

During 2004 and 2005, information from the major-field assessment plan was incorporated into the College of Arts and Science's Institutional Effectiveness plan under Strategic Initiative # 4: Academic Programs.

The five-year assessment review cycle will begin during Fall 2005. Each of the major-field assessment plans will be reviewed by a faculty committee and their suggestions will be presented to the Assessment Coordinating Committee.

Evaluation of assessment data: All candidates for graduation complete an assessment activity on DSU Assessment Day. Classes are cancelled one day each semester to facilitate the testing process. Since 1998, the Math for Information Systems majors complete the Major Field Assessment Exam (MFAT) in Mathematics; the double majors complete the MFAT in Computer Science also, both 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 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 assessment plans and data tables are available on the web at http://www.departments.dsu.edu/assessment/major_field/default.htm 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 2000-Spring 2001	Fall 2001-Spring 2002	Fall 2002-Spring 2003	Fall 2003-Spring 2004	Fall 2004-Spring 2005	Overall Mean and Std. Dev.	Percent Above (one standard dev. from the user norms mean)
DSU Math for Information Systems	N=3 155.3	N=3 170.3	N= 3 157.3	N=8 145.8	N=8 151.5	N=25 153.1 / 15.1	N=25 88%
User Norms						N=3877 152.4 / 17.7	

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

Changes made to the curriculum or to the program as a result of 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.

Other measures the college faculty use on a regular or periodic basis to aid in the evaluation of the curriculum and the effectiveness of the teaching/learning process

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. A summary of these surveys is available at http://www.departments.dsu.edu/assessment/Summary%20of%20Surveys.htm.

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. During 2000-2003, 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 SIR II produced by Educational Testing Services or a locally-developed evaluation instrument.

Interrelationships between the curriculum in the academic programs being reviewed and the introductory courses in the discipline that are included in the

- 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. On DSU Assessment Day, students complete proficiency testing in math, reading, English and science reasoning. In addition, all DSU students complete an online computer exam, the Tek.Xam. Students in the Math for Information Systems major had higher scores than the national norms in all four areas of the ACT CAAP proficiency exam.

Strategic Planning

Strategic Plan of Dakota State University

Beginning in 2002, campus-wide discussions led to a strategic plan which would direct funding and planning activity for the future. In the process of planning, the DSU community agreed on six threads which must be woven into the tapestry of DSU's strategic planning for the next several years. These include: Retention, Recruitment, Technology/Facilities Infrastructure, Academic Programs, Campus Management, and Resources.

The plan is intended to guide the institution and is a flexible and living document in that it must and will change as conditions change. It is intended as a guide for the strategic thinking of the faculty, staff, and administration of Dakota State University. In the planning process, the committee critically assessed the external environment, surveyed strengths and challenges and reviewed the campus mission statement. Strategic issues were identified, outcomes established, goals set and action plans devised.

Strategic Issue 1: Retention

- DSU will enrich the undergraduate experience and build the graduate experience

Strategic Issue 2: Recruitment
- DSU will increase enrollment through more focused recruitment strategies

Strategic Issue 3: Technology/Facilities Infrastructure
- DSU will continually enhance its technology and facilities infrastructure

Strategic Issue 4: Academic Programs
- DSU will sustain and enhance the quality of its academic programs

Strategic Issue 5: Campus Management
- DSU will manage its resources with optimum efficiency and open communication

Strategic Issue 6: Increase Resources
- DSU will expand its revenues from grants, contracts and private donations as a mechanism for supplementing the institution's overall budget

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. The plan is included in Appendix F.

Goal 1: Retention

- With conscientious advising, and by offering a variety of high-quality programs and courses, the College will retain greater numbers of students.

    1. The level of satisfaction of students in the College will increase, and students in College majors will be retained correspondingly.
    2. College courses will be taught in ways leading to greater success and convenience for students.

Goal 2: Recruitment

- Regional K-12 students and K-12 faculty will know and interact with College of Arts and Sciences faculty.
    - College faculty will increase their visibility in regional schools.The College will sponsor and encourage interactions with students and faculty via the web.
    - The College will bring students and faculty onto the DSU campus.
- As prospective students learn of the success of current DSU students and graduates, they will be attracted to the College's programs in increasing numbers.
    - The College will publicize student satisfaction on web pages or brochures or both.
    - The College will publicize small class on web pages or brochures or both.

Goal 3: Technology

- College faculty will expand the use of computers and scientific technology in appropriate and imaginative ways in courses throughout the College.
  - Faculty and students will use wireless mobile computers in traditional classrooms and in laboratories.
  - Faculty and students will use specialized graphics labs and Macintosh labs.
  - Faculty will have computer projection systems available for use in all appropriate courses.
  - Subject to available funding, science faculty will have additional and updated equipment to use in conjunction with computers and other scientific equipment.

Goal 4: Academic Programs

- Within a framework of assessment and program reviews, College faculty will evaluate present courses and programs, and they will plan and promote new curricula – including graduate degrees.
  - The College will review current programs.
  - New curricula will be planned and promoted.

Goal 5: College Management

- The College of Arts and Sciences will manage its resources with efficiency.
  - Subject to considerations of budget impact, the College will be organized into units that align disciplines.
  - The College will manage its financial resources with efficiency.

Goal 6: Research, Scholarship and Grant Writing

- College faculty will expand research, scholarship, artistic endeavors, and grant writing.
  - Research and scholarship will increase for College faculty.
  - Artistic endeavors will increase by arts faculty.
  - Grant applications will increase.