Dear Friends:

I believe in mission statements and strategic plans. When done well, they give any organization, business, or university a concise description of who they are, what they do, and why they do it.

Since I joined South Dakota Tech in July 2003, the campus has undertaken a strategic planning process to help us pursue our mission as an institution of higher education.

We began that process by reaffirming who we are. South Dakota Tech is dedicated to educating engineers and scientists. Based on the success of our alumni, it is what the university has always done well, and it is the arena where we will continue to excel.

We began a series of all-campus meetings, and we invited everyone interested to take part. Hundreds of faculty, staff, students, alumni, and community members joined us for these in-depth discussions about where this university should be headed and the steps we should take to achieve those goals.

The initial meetings resulted in four Strategic Initiatives — broad statements that identify the areas where we will focus our efforts. Our mission statement and those Strategic Initiatives appear on the page to the left.

This report is organized according to those strategic guideposts.

We have compiled data that describes the great work we are doing and the areas where we need to improve. This report — and more so, the process required to create it — is a valuable exercise in self-evaluation. It has required us to look in all the closets and under the beds. We asked hard questions and listened to the answers — even the ones we didn’t want to hear. You will also see photos from our past as well as our present. They are reminders of how far we have come as an institution since our founding in 1885.

The upside of asking hard questions is we now have goals — and with the talented group of people on this campus, I have no doubt we will reach them.

I value your thoughts and comments, for they have served us well in planning for our future here at South Dakota Tech.

I can be reached at charles.ruch@sdsmt.edu.

Very truly yours,

Charles Ruch
President
Improving the Curriculum for Teachers and Students

With a unique, cutting-edge program of study, South Dakota Tech can become the first choice for the best and brightest students from across the nation and around the world. We can — and will — consistently attract those who wish to pursue a high-quality education in engineering and science and leave with marketable skills.
Reshaping the Learning and Teaching Experience

Interdisciplinary Sciences (IS) Degree Program
We have realigned our Interdisciplinary Sciences degree so students will now focus in one of four areas to prepare for a career. Tech’s central mission is to provide an outstanding undergraduate education in science and engineering, and the changes to the IS degree provide students with a highly competitive, marketable skill set.

The four IS Degree specializations are:
• Atmospheric Sciences
• Pre-Professional Health Sciences
• Business Applications in Science and Technology
• Science, Technology, and Society

Improving the first year experience
FIRST (Freshman Introduction to Real Success at Tech) is a new program at Tech. Nationally, programs that integrate academics with residence hall neighborhoods show great success. Students who participate in these programs stay in college, get better grades, and graduate sooner.
FIRST participants attend the same core freshman classes and participate in residence hall neighborhoods where they study together to ensure success in the classroom. These are just a few of the benefits of the FIRST program.
**Opportunity Scholarships**

The South Dakota Legislature created the South Dakota Opportunity Scholarship to reward our state’s best and brightest high school students. Students who take the Regents Scholar Curriculum in high school, maintain good grades, and achieve an ACT score at least a 24 may qualify for the scholarship, worth up to $5,000 over four years of college study at any public or private South Dakota university.

### Placement Summary

#### 2002-03 Graduates (BS Degrees)

<table>
<thead>
<tr>
<th>Major</th>
<th># Grads</th>
<th>% Placed Overall</th>
<th>% Working in SD</th>
<th>Avg. Offer SD</th>
<th>Avg. Offer National</th>
<th>Avg. Offer SDM&amp;T</th>
<th>Avg. Offer National</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE</td>
<td>12</td>
<td>92%</td>
<td>25%</td>
<td>$51,889</td>
<td>$52,819</td>
<td>$42,333**</td>
<td></td>
</tr>
<tr>
<td>CHEM</td>
<td>10</td>
<td>100%</td>
<td>75%</td>
<td>$34,750</td>
<td>$36,675</td>
<td>$34,750**</td>
<td></td>
</tr>
<tr>
<td>CEE</td>
<td>34</td>
<td>94%</td>
<td>29%</td>
<td>$41,915</td>
<td>$42,053</td>
<td>$37,427</td>
<td></td>
</tr>
<tr>
<td>CENG</td>
<td>17</td>
<td>88%</td>
<td>25%</td>
<td>$53,591</td>
<td>$51,572</td>
<td>$35,500**</td>
<td></td>
</tr>
<tr>
<td>CSC</td>
<td>24</td>
<td>82%</td>
<td>60%</td>
<td>$53,077</td>
<td>$49,691</td>
<td>$42,846</td>
<td></td>
</tr>
<tr>
<td>EE</td>
<td>27</td>
<td>100%</td>
<td>5%</td>
<td>$51,409</td>
<td>$51,372</td>
<td>$31,000**</td>
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</tr>
<tr>
<td>ENVE</td>
<td>2</td>
<td>100%</td>
<td>100%</td>
<td>$41,615**</td>
<td>$43,175</td>
<td>$41,230**</td>
<td></td>
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<tr>
<td>GEOL</td>
<td>2</td>
<td>100%</td>
<td>0%</td>
<td>*</td>
<td>$39,167</td>
<td>*</td>
<td></td>
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<tr>
<td>GEOE</td>
<td>6</td>
<td>83%</td>
<td>50%</td>
<td>$41,896</td>
<td>$42,959</td>
<td>$35,880**</td>
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</tr>
<tr>
<td>IE</td>
<td>27</td>
<td>85%</td>
<td>48%</td>
<td>$45,315</td>
<td>$46,021</td>
<td>$35,600**</td>
<td></td>
</tr>
<tr>
<td>IS</td>
<td>32</td>
<td>85%</td>
<td>75%</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>MATH</td>
<td>3</td>
<td>100%</td>
<td>0%</td>
<td>*</td>
<td>$44,638</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>ME</td>
<td>36</td>
<td>92%</td>
<td>24%</td>
<td>$44,916</td>
<td>$48,864</td>
<td>$38,450**</td>
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</tr>
<tr>
<td>METE</td>
<td>7</td>
<td>100%</td>
<td>0%</td>
<td>$46,100</td>
<td>$49,000</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>MINE</td>
<td>2</td>
<td>100%</td>
<td>0%</td>
<td>$46,267</td>
<td>$42,859</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>PHYS</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>*</td>
<td>$37,279</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>241</td>
<td>38%</td>
<td>59%</td>
<td>$47,061</td>
<td>$39,683</td>
<td>$39,683</td>
<td></td>
</tr>
<tr>
<td>All Engineering</td>
<td>170</td>
<td>92%</td>
<td>38%</td>
<td>$46,266</td>
<td>$35,500**</td>
<td>$35,500**</td>
<td></td>
</tr>
<tr>
<td>All Science</td>
<td>71</td>
<td>88%</td>
<td>62%</td>
<td>$50,459</td>
<td>$41,077</td>
<td>$41,077</td>
<td></td>
</tr>
</tbody>
</table>

% Placed: (# students working in SD + graduate school + military/other)

*No salary reports or attending graduate school

**Average based on less than 5 salary reports

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### Total Opportunity Scholarships Awarded 2004

- Black Hills State University (BHSU) 29
- Dakota Wesleyan University (DWU) 9
- Dakota State University (DSU) 23
- Lake Area Technical Institute (LATI) 1
- Northern State University (NSU) 31
- Mitchell Technical Institute (MTI) 1
- SD School of Mines and Technology (SDSM&T) 67
- Mount Marty College (MMC) 16
- South Dakota State University (SDSU) 354
- National American University (NAU) 2
- University of South Dakota (USD) 174
- Presentation College 3
- Augustana College 81
- Southeast Technical Institute (STI) 4
- Colorado Technical University (CTU) 2
- University of Sioux Falls (USF) 28
- Western Dakota Technical Institute (WDTI) 1

**TOTAL 826**
Reshaping the Learning and Teaching Experience

**Fall 2004 Profile**

### Student Demographics

**Age Group**
- 17 or younger: 17 (<1.0%)
- 18-23: 1,562 (66.6%)
- 24-29: 457 (19.5%)
- 30-39: 194 (8.3%)
- 40-49: 89 (3.8%)
- 50 or older: 28 (1.2%)
- Total: 2,347 (100.0%)

**Ethnicity**
- White/Caucasian: 1,899 (80.9%)
- Unknown: 175 (7.5%)
- Non-US Citizen: 129 (5.5%)
- American Indian: 76 (3.2%)
- Asian/Pacific: 32 (1.4%)
- Hispanic: 26 (1.1%)
- Black/Non-Hispanic: 10 (0.4%)
- Total: 2,347 (100.0%)

**Gender**
- Male: 1,601 (68.2%)
- Female: 746 (31.8%)

**Enrollment Status**
- Full Time: 1,826 (77.8%)
- Part Time: 52 (22.2%)

### Enrollment

- Academic Enrollment: 2,347
  - Freshmen: 647 (27.6%)
  - Sophomore: 344 (14.7%)
  - Junior: 304 (13.0%)
  - Senior: 440 (18.7%)
  - Special: 327 (13.9%)
  - Graduate: 285 (12.1%)
- Tem/Part Time Faculty: 24
- Research/Administrative: 23

### Instructional Faculty

- Professor: 53
- Associate: 31
- Instructor: 8
- Tem/Part Time Faculty: 24
- Research/Administrative: 23

### Faculty and Staff

- Faculty: 143
- Staff*: 172
  - *Temporary employees included in this total
A dynamic research program attracts the attention of funding agencies and would-be students. Each group complements the other, with research providing the knowledge with which we train our students — and our best students contributing to this research and furthering our mutual success.
Promoting the Acquisition, Discovery, and Application of Knowledge

Research Initiatives

South Dakota Tech embraces research to solve problems of industry, the military, government agencies, and to generate economic development in Rapid City, the Black Hills, and the state of South Dakota.

- Black Hills Natural Sciences Field Station
- Center of Excellence for Advanced Manufacturing and Production (CAMP)
- Institute of Atmospheric Sciences (IAS)
- Additive Manufacturing Laboratory (AML)
- Advanced Materials Processing and Joining Laboratory (AMP)
- Analytical Characterization and Testing Laboratory (ACT)
- The Center for Accelerated Applications at the Nanoscale (CAAN)
- Computational Mechanics Laboratory (CML)
- Polymer Technology, Processing, and Composites Laboratory (PTPCL)
- Ultra-Lightweight Systems Laboratory
- Museum of Geology
- South Dakota Space Grant Consortium

FY 04 Research Funding

More than 50 South Dakota Tech faculty members and researchers received 93 research awards totaling $11.9 million during the 2004 fiscal year. The funding came from many different agencies, including the Army Research Laboratory, Air Force Research Laboratory, National Science Foundation, NASA, US Department of Interior, and the State of South Dakota.
Research Award Highlights 2004

Army Research Laboratory ..........................................$6,150,000
Advanced materials and processes for future combat systems

State of South Dakota’s 2010 Initiative ..........................$585,000
Creation of the Center for Accelerated Applications at the Nanoscale

NASA .............................................................................$512,100
Use of remote sensing for monitoring, prediction, and management of hydrologic, agricultural, and ecological processes in the northern Great Plains

United States Department of Education ........................$330,092
Strengthening student success through student data system enhancement and equipment upgrades

United States Department of Energy ............................$225,000
The Northern Rockies and Great Plains Regional Carbon Sequestration Partnership

National Science Foundation ..........................................$200,000
Create a women’s mentoring program

National Science Foundation ..........................................$109,491
Research Experience for Undergraduates collaboration with Mongolian University of Science and Technology

National Science Foundation ..........................................$109,159
Performance of microbiologically enhanced concrete structural elements

National Science Foundation ..........................................$100,000
Impact of lightning-produced nitric oxide on global climate change

Standing Rock Sioux Tribe
(Prime: United States Department of Interior) ................$80,554
Evaluation of the paleontological resources of Standing Rock Sioux Nation

National Science Foundation ..........................................$75,000
Role of continental wetland systems in regional climate

National Science Foundation ..........................................$40,000
Computational modeling and test validation of soil salt membranes

South Dakota Department of Environment and Natural Resources ..................................................$40,000
Demonstration project for arsenic removal from drinking water

Black Hills Corporation ....................................................$24,049
Use of Ben French Power Plant fly ash in concrete

Oglala Lakota College ......................................................$16,465
Support tribal college’s remote sensing laboratory

Total Awards Received for FYs 2000-2004

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Defense (DOD)</td>
<td>$6,448,984</td>
</tr>
<tr>
<td>National Science Foundation (NSF)</td>
<td>2,408,165</td>
</tr>
<tr>
<td>National Aeronautics and Space Administration (NASA)</td>
<td>1,077,100</td>
</tr>
<tr>
<td>Department of Energy (DOE)</td>
<td>575,000</td>
</tr>
<tr>
<td>Department of the Interior (DOI)</td>
<td>369,039</td>
</tr>
<tr>
<td>Department of Education (DOED)</td>
<td>339,692</td>
</tr>
<tr>
<td>Environmental Protection Agency (EPA)</td>
<td>314,927</td>
</tr>
<tr>
<td>Private</td>
<td>280,082</td>
</tr>
<tr>
<td>Other Federal</td>
<td>63,286</td>
</tr>
<tr>
<td>State</td>
<td>45,880</td>
</tr>
<tr>
<td>Total</td>
<td>$11,922,155</td>
</tr>
</tbody>
</table>

Awards have increased 94%
Promoting the Acquisition, Discovery, and Application of Knowledge

Masters Enrollment Demographics

Gender
- Male: 182 (76.5%)
- Female: 56 (19.8%)

Ethnicity
- White/Caucasian: 145 (60.9%)
- Asian/Pacific: 64 (29.6%)
- Other: 18 (7.6%)
- American Indian: 4 (1.7%)
- Black/Non-Hispanic: 4 (1.7%)
- Hispanic: 3 (1.3%)
- Total: 238 (100.0%)

Doctoral Enrollment Demographics

Gender
- Male: 29 (76.3%)
- Female: 9 (23.7%)

Ethnicity
- White/Caucasian: 27 (71.1%)
- Asian/Pacific: 7 (18.4%)
- Other: 2 (5.3%)
- American Indian: 1 (2.6%)
- Black/Non-Hispanic: 1 (2.6%)
- Hispanic: 1 (2.6%)
- Total: 38 (100.0%)

Fall 2004 Profile
In January 2004, President Charles Ruch of South Dakota Tech (right) and President Thomas Flickema of Black Hills State University (left) announced the Higher Education Center – West River partnership.

**Broadening Our Public Support**

By involving others in our educational efforts, we become more effective in the pursuit of our mission. These efforts at collaboration include the Native American community, other universities, as well as business, industry, and government agencies.
Engaging and Serving the Broader Community

Higher Education Center – West River

In January 2004, South Dakota Tech and Black Hills State University announced a series of strategies that will guarantee that all West River residents have easy access to higher education and all the benefits and expertise these universities offer. The Higher Education Center – West River will help higher education reach its full potential by helping people attain their goals and in helping create economic opportunities in South Dakota.
Degrees Offered

Associate of Arts Degree
General Studies

Bachelor of Science Degrees
Chemical Engineering
Chemistry
Civil Engineering
Computer Engineering
Computer Science
Electrical Engineering
Environmental Engineering
Geological Engineering
Geology
Industrial Engineering
Interdisciplinary Sciences
Mathematics
Mechanical Engineering
Metallurgical Engineering
Mining Engineering and Management
Physics

Master of Science Degrees
Atmospheric Sciences
Chemical Engineering
Civil Engineering
Computer Science
Electrical Engineering
Geology and Geological Engineering
Materials Engineering and Science
Mechanical Engineering
Paleontology
Technology Management

Doctor of Philosophy Degrees
Atmospheric and Environmental Studies
Geology and Geological Engineering
Materials Engineering and Science
Nanoscience and Nanotechnology*

*Proposed new program pending Faculty and Board of Regents approval

Community Outreach

We pride ourselves on being contributing members of our Rapid City community. Faculty, staff, and students donate time and money to organizations and charities throughout the Black Hills. We have a responsibility to share our expertise, our resources, and ourselves to make this an even better place to live, and we take that responsibility seriously.

We participate in:
• Athletics summer camps
• Black Hills Vision
• Engineering and science outreach to schools and businesses
• Engineers Week
• E-Week GIRLS
• Hands-on Partnership for Science
• Homestake Deep Underground Science and Engineering Laboratory
• NASA Honors Program
• Rapid City Area Chamber of Commerce
• Saint Catherine’s Island Sea Turtle Program
• Star of the West Speaker Series
• Summer teacher institutes
• Space Days
• The Nature of Things educational newspaper page
• Western Research Alliance
• Higher Education Center – West River
Accreditation

The South Dakota School of Mines and Technology is accredited by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools, the recognized accrediting agency for the north central states. In addition, the curriculum in Chemistry is accredited by the American Chemical Society. All engineering programs with the exception of Environmental Engineering and Mining Engineering and Management, which are new programs, are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), a special accreditation body recognized by the Council on Post-Secondary Accreditation and the U.S. Department of Education. The computer science program is accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology.

Marketing Initiative

The Tech story is too important to keep to ourselves. To remain competitive and to tell that story to more prospective students and community members, South Dakota Tech has undertaken an increased marketing effort. We have created a Marketing Director position, hired a consulting firm that specializes in higher education, created an Educational Programs and Conferences office, and begun to form a culture of marketing on campus.

Media Placement in 2004

World class research and instruction takes place with state-of-the-art equipment, facilities, and researchers. The smooth operation of those facilities depends on quality support services, and the growth of the university depends on managers with vision and a willingness to invest in marketing and promotion.

Gearing Up to Become More Competitive
Prefering for Our Future as a National Player

Becoming a National Player

South Dakota Tech continues to build on its reputation as a leader in engineering and science education and research. Tech professors and researchers are active in pursuing research grants from businesses, federal agencies, and foundations to create new knowledge and bring high-tech benefits to the state and nation. Tech staff and faculty also are sought for their expertise, and make regular appearances in local, regional, and national media. These strong foundations form the basis of an exciting future for South Dakota Tech.
Ribbon-cuttings and groundbreakings in 2004

Computational Mechanics Laboratory
Howard Peterson Hall
Christensen Hall of Fame
National Science Foundation Friction Stir Processing
   Industry/University Cooperative Research Center
South Dakota Tech Development Laboratory

Facilities

South Dakota Tech facilities include the Darold D. King Physical Education Building (gym capacity 2,100), the Chemistry/Chemical Engineering Building, the Civil/Mechanical Engineering Building, the Electrical Engineering/Physics Building, the McLaury Building, Devereaux Library, O’Harra Building, Mineral Industries Building, Surbeck Center, and the South Dakota Tech Development Laboratory

Renovation Projects

Computational Mechanics Addition to the Civil/Mechanical Engineering Building, expected completion Spring 2006.

SDSM&T Foundation Endowment
(as of June 30, 2004)

Endowed Scholarships and Fellowships* ...............$16,885,150
*Includes principal and earnings
Total Assets .................................................................$34,873,653
Number of Donors, FY 04 ............................................2,843
Total Donation, FY 04 .................................................$2,946,111

Operating Budget, FY 2004

Revenues

State Appropriations
   General Fund .................................................. ...$11,390,523
   Tuition and Fee Allocation .....................................4,901,522
   Other Tuition and Fees ...........................................3,671,020
   Auxiliary Sales and Services ....................................3,529,624
   Federal Grants and Contracts ..................................10,204,105
   State Grants and Contracts ......................................745,000
   Private Grants and Contracts ....................................725,000
   General Sales and Services ......................................860,000
   Other ...........................................................................2,497,326
Total Revenues .................................................. $38,524,150

Expenditures

Instruction .............................................................. $9,828,175
Research .....................................................................9,902,973
Public Service ............................................................1,203,332
Academic Support ....................................................4,054,062
Student Services .......................................................2,138,703
Institutional Support ................................................3,996,489
Physical Plant ............................................................1,807,490
Scholarships ..............................................................3,117,307
Auxiliary ...................................................................3,455,759
Total Expenditures .................................................. $38,524,150

Tuition and Fees, Fall 2004

Undergraduate  Resident  WUE/ADJ*  Non-Res.
Tuition and Fees* ......................................................$4,840  $5,960  $9,690
Room and Board† ......................................................3,960  3,960  3,960
Books and Supplies† .................................................850  850  850
Total ................................................................. $9,650  $10,770  $14,500

* (15 credits per semester)
† Rates based on approximate average. Costs may vary.

Graduate  Resident  Non-Res.
Tuition and Fees* ......................................................$3,725  $7,668
* Rates based on approximate average. Costs may vary.

*Western Undergraduate Exchange (WUE) tuition rate is offered to all students from the following states, regardless of major:

Endowed Scholarships and Fellowships* includes principal and earnings.
Preparing for Our Future as a National Player

The Center of Excellence for Advanced Manufacturing and Production (CAMP)

CAMP provides Tech students the best design and manufacturing education available. CAMP integrates students, faculty, and industry partners into a center whose purpose is to develop a unique approach to manufacturing education that also addresses the explicit needs of industry. Among their projects, CAMP students design, build, and compete with solar cars, concrete canoes, unmanned aerial vehicles, race cars, and other vehicles.

- Unmanned Aerial Vehicle: 1st place (Elegance of Design and Air Vehicle Innovation), 2nd place (static events), achieved autonomous flight
- Robotics: 3rd place
- Chemical Car: 4th place (poster competition)
- Concrete Canoe: 4th place
- Solar Car: 4th place
- Steel Bridge: 4th place
- Computer Programming: 5th, 8th, and 22nd places
- Human Powered Vehicle: 6th place
- Mini-Baja: 7th place
- Aero Design: 21st place
- Mini-Indy: 74th place

Nanotechnology: Small Science, Big Opportunities

Tech has proposed creating a Ph.D. in Nanoscience and Nanoengineering to continue advancing our research efforts in the emerging area of nanotechnology. South Dakota Board of Regents’ approval of the new program is pending the South Dakota Legislature’s approval of the governor’s budget. The new doctoral program will bring to campus researchers and graduate students who will play a role in directing the progress of nanotechnology research and will, along with Tech’s Center for Accelerated Applications at the Nanoscale (CAAN), by its very nature, create economic development opportunities in South Dakota and the Black Hills region. CAAN was created with a $585,000 grant from Governor Rounds’ 2010 Initiative.

Looking almost like lunar topographical images, these figures are atomic force microscope (AFM) images of a polymer next to a glass fiber. Fibers in polymers make up a class of advanced materials called composites. Composites that are being developed or improved at the nanometer scale could impact technology-based economic opportunities in Rapid City and South Dakota.
MISSION, VISION, AND GOAL

The South Dakota School of Mines and Technology serves the people of South Dakota as their technological university. Its mission is to provide a well-rounded education that prepares students for leadership roles in engineering and science; to advance the state of knowledge and application of this knowledge through research and scholarship; and to benefit the state, region, and nation through collaborative efforts in education and economic development.

South Dakota Tech is dedicated to being a leader in 21st Century education that reflects a belief in the role of engineers and scientists as crucial to the advancement of society. Our vision is to be recognized as a premiere technological university in the United States.

Most immediately, our goal is to be recognized as the university of choice for engineering and science within South Dakota and among our peer group of specialized engineering and science universities.

STRATEGIC INITIATIVES

1. Reshape the Learning and Teaching Experience
2. Promote the Acquisition, Discovery, and Application of Knowledge
3. Engage and Serve the Broader Community
4. Prepare for Our Future as a National Player in Science and Engineering Education and Research