Colorado School of Mines
Self Study Report
for the Higher Learning Commission
of the North Central Association
September 16, 2002

Introduction

a. Brief profile of the institution, including special qualities and distinctive programs.

In 1874 the Territorial Legislature of Colorado passed an appropriation of $5,000 and commissioned W. A. H. Loveland and a Board of Trustees to found the Territorial School of Mines in or near Golden. Governor Routt signed the bill on February 9, 1874. With the achievement of statehood in 1876, the Colorado School of Mines was constitutionally established. The first diploma was awarded in 1882.

Throughout its history, the Colorado School of Mines has been driven by a mission that reflects education and advancement in those fields of engineering and applied science that have a bearing on the Earth and the stewardship of its resources. As a public institution in the state of Colorado, its mission is recorded in state statutes and was last updated in 1985:

> The Colorado School of Mines shall be a specialized baccalaureate and graduate research institution with high admission standards. The Colorado School of Mines shall have a unique mission in energy, mineral, and materials science and engineering and associated engineering and science fields. The school shall be the primary institution of higher education offering energy, mineral and materials science and mineral engineering degrees at both the graduate and undergraduate levels.
> *(Colorado Revised Statutes 23-41-105)*

A 2001 mission review by the Governor's Blue Ribbon panel recommended no change to CSM's mission, though it did recommend changes for all of the other institutions of higher education in Colorado. In 2002 the General Assembly agreed to keep the CSM mission unchanged.

President John Trefny has emphasized his vision of CSM as a Connected Learning Community in which the whole is greater than the sum of the parts and all individuals and entities work for the common good of the institution. Some of the specifics of that vision are outlined in his "Starting Points for a Strategic Plan." The special nature of CSM was recently recognized by the State when CSM was named an "exemplary institution," the only one in Colorado. The resulting agreement between the Colorado Commission on Higher Education (CCHE) and CSM allows the institution more flexibility than other institutions in the State in dealing with the CCHE.

Colorado School of Mines currently enrolls approximately 2,500 undergraduate and 700 graduate students and employs approximately 200 full-time faculty members. The School pursues its mission through baccalaureate, masters and doctoral program offerings in engineering, applied science and economics. There are eight engineering baccalaureate programs, including Mining Engineering, Geological Engineering, Geophysical Engineering, Petroleum Engineering, Chemical Engineering, Engineering (Civil, Electrical, Mechanical, and Environmental specialties), Metallurgical and Materials Engineering, and Engineering Physics. Three science baccalaureate programs cover the Mathematical and Computer Sciences, Chemistry, and Economics. There are thirty-nine masters and doctoral programs spanning the areas listed above, plus Environmental Science and Engineering. A Division of Liberal Arts and International Studies offers general education courses that are integrated in all undergraduate programs, offers

undergraduate minors, augments curricula at the graduate level, and has recently developed a graduate certificate in international political economy. The academic programs are organized into thirteen academic units.

Results from student satisfaction surveys in 1998 and 1999 indicate that our undergraduate students place most emphasis on the following goals in their quest for an education at CSM:

- to build depth of knowledge in the areas of their degrees;
- to receive an education that enhances career flexibility, and
- to be employable in their fields of expertise.

Although they are employed in a wide variety of fields, most of our alumni are members of the technical community served by the School. A sample of our alumni base that is influential in this technical community is represented by our Trustees Development Council. This council has identified a number of earned distinctions that characterize the School, and it has called upon the School to uphold these distinctions. According to the Council (minutes of Oct. 14-16, 1998 meeting), the Colorado School of Mines:

- enjoys an international reputation;
- produces integrated, well-prepared graduates;
- admits students of high intellectual caliber;
- promotes an excellent work ethic and perseverance;
- promotes a "fraternal" bond and perceived exclusivity;
- is defined by its students and graduates;
- is student-focused, hands-on, and achievement oriented; and
- forges strong partnerships with industry, and has a curriculum that is responsive to that relationship.

Recruiters are attracted to graduates of the Colorado School of Mines because of the disciplines served in engineering and applied science, and because of the educational strengths of the graduates and their ability to communicate this knowledge effectively in a business environment. According to a recent survey (Employer/Recruiter Survey, 1998-1999), recruiters view the dominant strengths of CSM graduates to be in project experience, discipline-specific knowledge, general knowledge, and experience.

Resource Room
President Trefny's Starting Points
Appropriate State Statutes
Exemplary Institution Bill
Exemplary Institution Agreement
Employer/Recruiter Survey (1998-1999)
Trustees' Development Council minutes
Student Satisfaction Surveys (1998, 1999)

b. A summary of the institution's accreditation history.

CSM was accredited by NCA from 1929 through 1935. The current accreditation status with NCA began in 1960. The most recent comprehensive evaluation took place on October 25-28, 1992. At that time the team concluded that "the institution fully meets all of the Commission's Criteria for Accreditation and can reasonably be expected to

continue to meet these criteria during the next decade." Specific concerns raised in the 1992 visit will be addressed in Section F below.

In addition to institutional accreditation through NCA (now the Higher Learning Commission), all of CSM's engineering programs are accredited by the Accreditation Board for Engineering and Technology (ABET). The most recent ABET visit was in October 2000 when all 8 engineering programs were accredited until 2007. In addition, the undergraduate program in Chemistry and Geochemistry is accredited by the American Chemical Society, most recently in December 1998. The next accreditation visit is scheduled for 2003.

Resource Room
1992 NCA Team Report
ABET Accreditation document

c. The purposes of and audience(s) for the report.

The audiences for the self-study report include all of the CSM community (students and potential students and their parents, faculty, staff, administrative faculty, the Board of Trustees, alumni, visiting committee members, and educational partners such as the Petroleum Institute in Abu Dhabi) as well as the Colorado and national higher education communities, the State legislature, the Colorado Commission on Higher Education, the citizens of Colorado, and the industries which hire our graduates.

We have several purposes for the self-study report:

- To continue accreditation;
- To examine our own programs, practices, and services and work to continuously improve them;
- To take a broad view of the institution, beyond what ABET accreditation requires;
- To inform the audiences listed above of our current status and future hopes;
- To obtain an external objective review of our strengths and weaknesses;
- To strategize methods to address our weaknesses and opportunities.

d. The organization of the report.

The report is organized following the outline on pages 75-78 in the *Handbook of Accreditation.* The Introduction is followed by a discussion of Criteria 1-5 (each including a SWOT analysis of that criterion), a summary, and appendices including the General Institutional Requirements and BID documents. Each section of the report also lists materials which will be found in the Resource Room during the Higher Learning Commission visit.

e. Review of the self-study process.

CSM has had a continuous improvement process in place since the late 1980's, when the State of Colorado mandated that each institution in the State must develop and maintain an assessment program. Out of our assessment efforts (discussed under Criterion 3 below) grew the Assessment Committee, the Curriculum Review Steering Committee, the Academic Planning Council, and more recently, the Curriculum Committee and the Strategic Planning Task Force. All of these groups worked or are working towards continuous review of our institutional goals and curricula. They function in concert with

standing committees such as the Undergraduate Council, the Graduate Council, the Research Council, the Administrative Faculty Council, the Faculty Senate, the *Faculty Handbook* Committee, and other long-standing campus entities. In addition, student government groups such as Associated Students of CSM and Graduate Student Association have input into the campus improvement process, and students serve on many university committees. More on the contributions of these groups will be found in the body of the report.

In the fall of 2000, all of our engineering programs were reviewed by the Accreditation Board for Engineering and Technology (ABET). In preparation for that visit, a volume on "Institutional Actions Since the Last General Review (1994)" was prepared to accompany program self-study reports from all of the accredited engineering programs. We have simultaneously been preparing for the Higher Learning Commission visit by attending the annual NCA meeting (Vice President Nigel Middleton in 2000, Associate Vice President Barbara Olds in 2001) and working with a Higher Learning Commission Self Study Steering Committee composed of members from all elements of campus life. A list of the names and titles of the Steering Committee members can be found in Appendix A along with the accreditation visit timeline.

Resource Room
ABET "Institutional Actions"

f. The institution's response to the most recent NCA Team Report .

In this section, we will respond briefly to each of the concerns raised in the 1992 NCA Team Report. More detail addressing these concerns will be found in the body of the Self-Study Report. In addition, a copy of the 1992 Team Report and a response to the entire report will be found in the Resource Room.

1. *"The level of state funding for operations is low for a public university, and the future level is uncertain."*

   State funding for the School increased during the 90s, rising from $12.1 million in FY 1993-94 to over $20 million in FY 2001-02. However, State support for higher education in Colorado has never been strong and current State revenue shortfalls have caused funding reductions in the FY 2002 and FY 2003 fiscal years. Thus, concerns with State funding at this time are tied to the State's revenue situation and will continue until the economy improves. This is not a unique Colorado phenomenon, as most states are experiencing similar shortfalls with resultant impacts on publicly funded higher education.

   In addition to operating support, the State has provided significant capital construction and maintenance funds to the School over the past 10 years, supporting the construction of new buildings, building additions, and building renewal. Construction data going back to 1993 show State funded capital construction projects totaling $56.3M plus State-funded controlled maintenance projects totaling $8M (an additional $1.3M in controlled maintenance funds were recently frozen due to a decline in State revenue).

The recently negotiated performance agreement with the Colorado Commission on Higher Education, pursuant to the School's Exemplary Institution status, is structured to stabilize State support generally as well as to add State support based on graduate student enrollment.

In recent years, Mines has diversified its various revenue sources significantly. The School has benefited from increased revenues from tuition and fees, research grants, and fundraising. A capital campaign, Resources for CSM, raised $73 million for the School between 1989 and 1994. Although it has fallen somewhat in recent months, the current endowment stands at $109.4 million, quite high compared to most other Colorado institutions. Colorado State University, for example, a much larger institution, has an endowment of about $103 million according to recent article in the *Rocky Mountain News*. Only the University of Colorado System ($375 million) and the University of Denver, a private school about twice the size of CSM (about $145 million), have larger endowments in the state. Currently, a capital campaign to raise an additional $125 million is in its silent phase with approximately $40 million already in hand. According to the *Chronicle of Higher Education* (http://chronicle.com/weekly/almanac/2002/nation/0103601.htm), CSM has the 15th largest endowment per student ($39,981)of any public institution in the country. The recent initiative to partner with Abu Dhabi in the creation of its Petroleum Institute is providing additional significant new capital resources ($31 million over 10 years).

Resource Room
Exemplary Institution agreement
CSM Approved Budgets for past 5 years

2. *"In spite of some efforts, there remains a low representation of minorities in the faculty and a low representation of both women and minorities in the administration."*

CSM has a goal to attain a level of faculty and staff diversity that matches that of the student body. For minority faculty, Mines continues to meet its goal, with total minority student enrollment at 11.2% and minority faculty at 13.5% (2002 Diversity Report), up from 9.2% in 1994-95. *The 2001 Chronicle of Higher Education Almanac* (p. 28) shows minority faculty for all disciplines nationally at 13.4% (1997 data). Nationally, the percentage of minority Ph.D. graduates in engineering and technology is only 9.8% (*Engineering Workforce Commission of the American Association of Engineering Societies, Inc—Engineering and Technology Degrees 2001*). According to a 2001 ASEE study, Hispanics comprised 2.9 percent and African-Americans 2.1 percent of tenure/tenure-track faculty in engineering schools. Of the 23 minority faculty members on campus during 2001, 17 are Asian and 6 are Hispanic/Latino. CSM currently has no full-time Native American or African American faculty members.
Mines continues to make progress toward its stated goal of matching the percentage of female faculty to the percentage of women students. Female student enrollment is at 25.8% versus female faculty, which is at 18.2% (16.7% if

only full time academic faculty are included). According to the American Society for Engineering Education, women comprised only 8.9 percent of tenure/tenure track faculty in engineering schools.

As part of Colorado School of Mines' goal of becoming a Connected Learning Community, the institution is committed to recruiting and retaining a diverse faculty. The Women in Science, Engineering, and Mathematics program (WISEM), Minority Engineering Program (MEP) and the Diversity Committee are active groups working to make the CSM campus more diverse. With strong support from the Administration, these groups are working to develop and implement specific strategies for identifying qualified women and minority candidates and encouraging them to apply for advertised faculty positions. Among these strategies are the following:

- Advertising to targeted audiences
- Developing better informational materials for potential faculty
- Conducting focus groups with current women and minority faculty
- Working with department heads/division directors to develop proactive recruiting strategies for women and minorities
- Exploring external funding opportunities. The School applied for an NSF ADVANCE grant in 2001 but, despite good reviews, it was not funded. (The ADVANCE program focuses on improving the climate for and status of women faculty, by promoting their recruitment, retention and rewards.) Another ADVANCE proposal is being submitted in September 2002.

Since 1994-95, female administrative faculty have increased from 41.3% of the total to 53.6% of the total. Three Associate Vice President positions are held by women--the current Associate Vice President for Academic Affairs (Barbara M. Olds), Associate Vice President for Finance and Operations (Hille Dais), and Associate Vice President of Institutional Advancement (Maureen Silva). A woman serves as Division Director of the largest academic unit on campus, the Engineering Division (Joan Gosink). In fact, because of the large enrollment in its interdisciplinary program, Dr. Gosink's position is viewed in the engineering education community as the equivalent of a Dean of Engineering.

Resource Room
2002 Diversity Report
2002 WISEM Report
2002 ADVANCE Proposal

3. *"There is inadequate self-analysis and institutional research at CSM that makes the systematic assessment of progress difficult and limits the ability of the institution to demonstrate its excellence to itself and its constituencies."*

Shortly after the last NCA visit, the Institutional Research program was implemented in the Office of External Affairs and has continued to develop to the present. In 1993, these responsibilities were transferred to the Office of Budget and Planning and more staff resources were made available. In 1998, we created a separate Office of Institutional Research and hired a director. This office has

helped coordinate several campus-wide projects such as the legislatively mandated two-year statewide study of higher education, ABET accreditation, the development of a campus master plan, a role and mission review by the Governor's Blue Ribbon Panel, implementation of new remedial education requirements, and the Higher Learning Commission visit.

Self-analysis also occurs each summer when the School sponsors the Board of Trustees retreat to focus on specific topics of interest to the CSM community. In addition to the Board members, School administrators, department heads/division directors, faculty, students, and staff participate in these retreats. Focus topics of the past few years have included curriculum reform, the graduate program, and strategic planning. These meetings led to follow-up activities on campus and have resulted in a range of outcomes including a comprehensive retention study, the formation of a Strategic Planning Committee, and a variety of curriculum reforms. External visiting committees for each department/division also provide welcome input to those units' self-analysis.

When the institution, through its self-analysis process, detects a need for more detailed examination of an issue, it may also hire outside expertise. Three recent examples include an analysis of our sports and athletics program, a campus climate report and the thorough review of the Human Resources office by the Cedar consulting group (http://csmis5.mines.edu/fo/FINALD~1.pdf) .

Resource Room
Sports and Athletics Report
Campus Climate Report
Board of Trustees retreat notes

4. *"Maintaining the School's tradition of excellence in natural resource fields, dealing with expanding enrollment in other programs, and launching new initiatives simultaneously with an enrollment cap of 3000 is a strategic dilemma that the Colorado School of Mines must solve."*

Although the items enumerated here continue to challenge CSM, we believe that we have dealt quite well with them over the past decade. For example, our undergraduate and graduate student bodies remain robust and of high quality; our research base is stronger than ever ($30.3 million in funded research in fiscal 2002); and the institution has a new focus on six interdisciplinary "Areas of Preeminence" (engineering education, materials, computational science and engineering, mining and underground engineering, energy, and the environment) in conjunction with a strategic planning initiative. The Abu Dhabi National Oil Company (ADNOC) has selected CSM to help develop a new institution, the Petroleum Institute, using CSM expertise and curricula as a model. We have been named the only Exemplary Institution by the State of Colorado, a designation that gives us a unique status among the higher education institutions in the State. The Carnegie Foundation for the Advancement of Teaching selected CSM as one of only six engineering schools in the nation to visit in preparation for a monograph on best practices in engineering education.

All of this has been accomplished with the size of our student body remaining relatively stable. Although we do not have a numerical enrollment cap, our Board of Trustees has confirmed, at its November 2001 meeting, that CSM will remain a small, residential college of about 3200 students. We believe that despite the continuing challenge of balancing enrollments among departments, CSM is a stronger institution than ever. However, we continue to struggle with uneven distribution of students among majors. The Curriculum Committee, among other groups, is exploring ways of distributing students more equitably without setting "quotas" or diverting students from studying in a major they wish.

Resource Room
Trustees "starting points"
Exemplary Institution agreement
Petroleum Institute information
Curriculum Committee notes

5. *"Continued efforts to improve communication between faculty and administration are needed. Securing a successful future for the Colorado School of Mines requires continued dialog and healing within the campus community."*

Although communication channels could always be more numerous and more open, we believe that a number of venues for communication have been added or improved since 1992. The tense climate that existed between faculty and the Administration in 1992 is, for the most part, a thing of the past. President Trefny's vision of a Connected Learning Community is reflected by a number of activities that involve the whole campus, the most notable being the annual Celebration of Mines in which faculty, staff, and students come together for a day of fun and interaction. Communication between the faculty (represented by the Faculty Senate) and the Administration has improved gradually and continuously over the decade. An Executive Committee consisting of administrators, department heads/division directors, and faculty senators meets monthly to discuss issues of interest to the campus community. The vice presidents meet weekly with the president. Each department/division holds weekly faculty/staff meetings and the department heads/division directors also meet weekly as a group.

The internet has made communication easier in many ways. For example, we now publish a weekly online *Campus in Brief* newsletter. We use e-mail lists for the whole campus as well as subset lists for students, classified staff, faculty, department heads/division directors, etc. for rapid communication. The Faculty Senate also has a website (http://www.mines.edu/Fac_staff/senate/). In addition, many policies and procedures can now be easily accessed on the web, including the entire Faculty Handbook (http://www.mines.edu/Academic/affairs/fachandbook/). We are hoping to complete an updated Academic Affairs Procedures Manual this fall. Communication and interaction has improved between the Graduate School and graduate coordinators involved in graduate affairs, i.e. recruiting, admissions, and advising graduate students on campus.

Resource Room
Celebration of Mines information
Back issues of *Update*
Back issues of *Campus in Brief*

6. *"There is uncertainty and anxiety among a number of junior faculty regarding the criteria and procedures for tenure decisions. While turnover in departmental administration and changing institutional standards have contributed to this uncertainty and anxiety, there is a need to communicate explicitly and regularly to tenure track faculty their progress toward tenure."*

We have taken a number of actions in the past ten years to alleviate the anxiety about the criteria and procedures for tenure decisions. First, the *Faculty Handbook* now clearly spells out the tenure and promotion process. The appeal process is also clearly outlined in the *Handbook*. In addition, we have instituted a campus-wide Promotion and Tenure Committee, now in its third year, which replaced the department head/division director group which had previously functioned in this capacity. This faculty committee reviews the tenure and promotion packets of all candidates and makes independent recommendations to the Vice President for Academic Affairs. The institution of this committee, composed of well-respected senior faculty members nominated by the Faculty Senate and appointed by the Vice President for Academic Affairs, has helped to increase campus-wide confidence in the process.

Department heads/division directors work closely with new faculty members to develop a "blueprint for tenure" early in their time at CSM. We have established a third year review process for tenure-track faculty so that they will have an opportunity to receive formal feedback from their departmental P&T committees and department head/division director in time to make midcourse corrections if they are not making satisfactory progress towards tenure after three years. Several departments/divisions have also instituted formal or informal mentoring programs for new faculty. An informal women's faculty group meets regularly and, in addition to other discussions, advises female candidates about tenure and promotion issues.

Resource Room
Faculty Handbook

7. *"The library is increasingly underfunded because of the emergence of new doctoral programs and the growth of graduate education and research."*

Although funding for the Library has nearly doubled in the past ten years (from $544K in 1995-1996 to $952K for 2002-2003), it is difficult to keep up with demand. We are hopeful of building the Library endowment through philanthropic giving; the current fundraising campaign has a goal of $7 million for library endowments, of which more than $1 million has already been raised.

Despite this progress, the issue of library support for programs and research remains a problem, and has been exacerbated by decade-long significant price increases for scholarly materials, particularly in science and technology journals. In response, the Library has systematically reviewed its acquisitions policies and journal subscriptions over the last decade to remove non-essentials and promote greater efficiency. Departments/divisions requesting new programs must now indicate the impact of the program on library resources. Communication mechanisms with students and faculty such as the Library Advisory Committee have helped the Library disseminate information and gather feedback on the purchase of materials.

Our library consortium acquisitions of scholarly electronic databases and journals have helped reduce some costs and now provide access to a wide range of information. The CSM Library is an active participant in its consortium's union catalog and document delivery program as well as national/international interlibrary loan activities; reciprocal lending agreements provide CSM users with access to many materials owned by other libraries. All of these activities help counterbalance, but cannot compensate entirely for, the lack of funding for information resources needed to support graduate education and research on this campus.

8. *"The institution invites serious risks not having an internal auditor."*

While the position of an internal auditor would, in all likelihood, be beneficial for an institution like the School of Mines, we have found that other initiatives, including the engagement of outside consultants for focused study, have worked well for us. For example, we have hired consultants to review our Human Resources function, to help with our strategic planning initiative, and to examine campus climate issues.

In addition, Mines has strengthened its legal services staffing (two attorneys and staff support) to deal with issues of risk in a variety of areas, including human resources and immigration. The School is audited annually by an external firm chosen by the Office of the State Auditor.

g. Changes and/or significant developments since the most recent comprehensive evaluation.

A number of significant developments have taken place since the most recent comprehensive evaluation, including those listed below. These will be discussed in more depth in the body of the report. Supplementary material on all of these developments will be available in the Resource Room.

- The Curriculum Reform Project (1994-present)
- Increased emphasis on assessment, evaluation, and continuous improvement
- Retention project
- The founding of the Diversity Committee and the WISEM program

- The agreement with the Petroleum Institute in Abu Dhabi
- The establishment of a variety of new centers with wide-ranging foci
- The enhancement and growth of international programs and the creation of the Office of International Programs
- The Exemplary Institution Bill
- A successful ABET visit in 2000 (all eight engineering programs visited were re-accredited for a full six years)
- A campus Ombuds program for graduate students
- The continuing renovation of the campus and the construction of the CTLM and Research buildings.
- The creation of the Writing Program
- The addition of many new non-thesis master degrees, combined undergraduate-graduate degree programs, individualized and interdisciplinary graduate degrees and certificates, and introduction of professional master programs.

In addition, there have been several changes in the administration over the past ten years: Dr.George Ansell retired as president in 1998 and was replaced after a national search by Dr. Theodore Bickart, who was previously the Dean of Engineering at Michigan State University. Dr. Bickart served as President for two years and then retired in May of 2000. At that time Dr. John Trefny, the Vice President for Academic Affairs, became Interim President and served in that capacity until he was named President by the Board of Trustees after a national search in August of 2001. Dr. Nigel Middleton, former Associate Vice President for Academic Affairs, was named Vice President for Academic Affairs in the fall of 2001. Dr. Arthur Kidnay resigned as Dean of Graduate Studies and Research in 1998 and was replaced by Dr. Phil Romig. Mr. Robert Moore became Vice President for Finance and Operations in 1995 and Mr. Peter Han was named Vice President for Institutional Advancement in 2002. There have been several changes among the associate vice presidents and department heads/division directors as well, as noted below:

Associate Vice Presidents (name, title, position start date)
Barbara M. Olds, Associate Vice President for Academic Affairs, 2001
Hille Dais, Associate Vice President for Finance and Operations, 1999
Maureen Silva, Associate Vice President for Institutional Advancement, 2002

Department Heads/Division Directors (name, department/division, position start date)
Rod Eggert, Economics and Business, 1998
James Ely, Chemical Engineering, 2000
Graeme Fairweather, Mathematical and Computer Sciences, 1994
Joan Gosink, Engineering, 1992
Murray Hitzman, Geology and Geological Engineering, 2002
Paul Jagodzinski, Chemistry and Geochemistry, 2001
James McNeil, Engineering Physics, 2000
John Moore, Metallurgical and Materials Engineering, 1989

Tibor Rozgonyi, Mining Engineering, 1995
Arthur Sacks, Liberal Arts and International Studies, 1993
Robert Siegrist, Environmental Science and Engineering, 2001
Craig Van Kirk, Petroleum Engineering, 1980
Terry Young, Geophysical Engineering, 2000

Criterion 1: "*The institution has clear and publicly stated purposes consistent with its mission and appropriate to an institution of higher education.*"

a. "long and short range institutional and educational goals"

In addition to its statutory mission (see page 1), CSM has clear, consistent, and publicly stated purposes appropriate to that mission. Institutional goals, both short and long range,

are developed and implemented with input from all campus constituencies. The Board of Trustees, in addition to its monthly meetings, holds an annual retreat in which institutional goals are discussed and refined with input from the administration, department heads/division directors, students and faculty. In addition, President Trefny has instituted a Strategic Planning Task Force chaired by Vice President for Academic Affairs Nigel Middleton; this group plans to have a draft strategic plan ready for campus-wide discussion by the end of the calendar year.

CSM's broad educational goals can be found in the section of the Undergraduate Bulletin entitled "The Academic Environment" (page 5) which includes the list of attributes known as the Profile of the Colorado School of Mines Graduate. This document reflects the input of all CSM constituents in articulating those educational attributes that characterize the ideal engineering and science graduate of the School in the 21st Century. The Profile (Table 1) was approved by the CSM Board of Trustees in November 1994. It has been the driving force for our institution-wide curriculum reform and assessment programs. In addition, we have developed similar documents for graduate programs, professional education, and research. These documents will be found in Appendix B.

All academic departments submit annual academic plans projecting their goals for the next five years. These are updated to reflect changes in enrollment, departmental focus, and research opportunities. The Curriculum Reform Steering Committee (1994-2000) and now the Curriculum Committee (2002-present) help to provide guidance about curriculum issues on an institution-wide basis.

Resource Room
Undergraduate & Graduate Bulletins
Board of Trustees minutes and
Retreat notes
Departmental Academic Plans
Curriculum Committee Notes
CRSC Documents

Table 1: Profile of the Colorado School of Mines Graduate

Profile
of the Colorado School of Mines Graduate

- All CSM graduates must have depth in an area of specialization, enhanced by hands-on experiential learning, and breadth in allied fields. They must have the knowledge and skills to be

able to recognize, define and solve problems by applying sound scientific and engineering principles. These attributes uniquely distinguish our graduates to better function in increasingly competitive and diverse technical professional environments.

- Graduates must have the skills to communicate information, concepts and ideas effectively orally, in writing, and graphically. They must be skilled in the retrieval, interpretation and development of technical information by various means, including the use of computer-aided techniques.

- Graduates should have the flexibility to adjust to the ever-changing professional environment and appreciate diverse approaches to understanding and solving society's problems. They should have the creativity, resourcefulness, receptivity and breadth of interests to think critically about a wide range of cross-disciplinary issues. They should be prepared to assume leadership roles and possess the skills and attitudes which promote teamwork and cooperation and to continue their own growth through life-long learning.

- Graduates should be capable of working effectively in an international environment, and be able to succeed in an increasingly interdependent world where borders between cultures and economies are becoming less distinct. They should appreciate the traditions and languages of other cultures, and value diversity in their own society.

- Graduates should exhibit ethical behavior and integrity. They should also demonstrate perseverance and have pride in accomplishment. They should assume a responsibility to enhance their professions through service and leadership and should be responsible citizens who serve society, particularly through stewardship of the environment.

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b. "processes, involving its constituencies, through which the institution evaluates its purposes":

The Colorado School of Mines has in place a variety of processes involving its constituencies through which it regularly evaluates its purposes and its curriculum. Among these are:

- *Faculty Senate* – serves as faculty's representative in approving changes to curriculum, graduation lists, etc.
- *Department Heads/Division Directors*—this leadership group meets weekly to discuss a broad range of issues related to the institution and to make recommendations for policies, curriculum, budgetary issues, etc.
- *Alumni and current students* – provide input, both formally and informally, through surveys, campus visits, recruiting, course evaluations, departmental advisory committees, student government, etc.
- *Visiting Committees* – composed of academics, industry, and government representatives, they meet for an audit visit every three years to review departmental programs and make recommendations to the administration and Board of Trustees.
- *The Board of Trustees* – ultimately responsible for the School, they approve major changes in the School and assure accountability and faithfulness to the CSM mission.

- *Industry representatives and recruiters* – through their input in sponsoring research and hiring CSM graduates, they provide valuable input into the outcomes of our learning strategies.
- *ABET, ACS, the Higher Learning Commission and other accreditors* – they certify that we are meeting their standards in providing quality education to our students.
- *The Colorado Commission on Higher Education* – ensures that CSM is in compliance with State legislation for higher education and is accountable to the taxpayers
- *Parents, prospective students* – they decide on attendance at CSM, or not, based on their perception of our quality and performance.

Resource Room
Department Head/Div. Director minutes
Board of Trustees minutes
Visiting Committee reports & responses (sample)

c. "decision-making processes appropriate to its stated mission…":

In general, policy enactment powers at CSM reside with the Board of Trustees in accordance with their statutory responsibilities. According to the Preface to the *Faculty Handbook*, "The Board desires to establish a collaborative environment in which all participants work together for the ultimate welfare of the institution, the students, and the faculty." Processes are in place to ensure that the Board and other campus entities are able to make informed decisions. There is a strong committee structure on campus that includes both Senate and University Committees. Information on the Faculty Senate and its committees can be found at http://www.mines.edu/Fac_staff/senate/home.html. Curriculum issues are the purview of the faculty through their representatives on the Faculty Senate, and the Board awards degrees subject to the recommendation of the Faculty. Senate committees include Academic Standards and Policies; Committee on Committees; Evaluation; Executive Council; Faculty Affairs; Graduate Council; Readmissions; Research Council; Undergraduate Council; Scholastic Awards; and Sports and Athletics. University Committees include the Athletic Board; the Board of Student Publications; Budget Committee; *Faculty Handbook* Committee; Safety Committee; Undergraduate Student Affairs Committee; Calendar Committee; Biosafety Committee; and Promotion and Tenure Committee. Information on how the University Committees are constituted and function can be found in the *Faculty Handbook*. In general, issues are first discussed in the committee(s) and then, as appropriate, referred to the Senate, the Administration and/or the BOT for final approval.

Resource Room
Faculty Senate minutes
Board of Trustees minutes
List of current committee members

d. "understanding of the stated purposes by institutional constituencies"

The Colorado School of Mines has a very clearly focused mission that is broadly understood among our constituencies, internationally, nationally and locally. New initiatives for the School are always compared against the mission; they must fit within our role and mission to be considered by the Board of Trustees and by the Colorado

Commission on Higher Education. New faculty employees are provided with a thorough orientation to the school that emphasizes our role and mission. Starting in the fall of 2002, the School invites all new employees to a monthly welcome luncheon and campus tour, where they learn about the history, role and mission of CSM.

Students and prospective students are obviously an important constituency. They are currently informed about the School through the Discover CSM and Explore CSM programs.

Resource Room
Discover & Explore CSM documents

e. "efforts to keep public informed of its institutional and educational goals through documents such as the catalog and program brochures"

We keep the public informed about our goals through a variety of means including the following. Copies of all of these materials can be found in the Resource Room.

- Undergraduate and graduate bulletins (both hard copy and on-line)
- *Graduate Student Handbook*
- *Brunton* (undergraduate handbook)
- Graduate program brochures
- *Update*
- *Mines Magazine*
- *Campus in Brief*
- *Oredigger* (student newspaper)
- CSM Foundation reports
- CSM Web pages (http://www.mines.edu)
- Graduate surveys conducted by the Graduate Office
- Press releases through the Public Affairs department
- SPACE (Special Programs and Continuing Education) materials

f. "support for freedom of inquiry for faculty and students"

According to the *Faculty Handbook* (Section 5.1), "Colorado law vests the instructional power of CSM in its faculty. In carrying out their instructional responsibilities at CSM, faculty members enjoy the right of academic freedom as it is generally defined and accepted in the academic community." The Office of Student Activities has a policy on Distribution of Literature and Free Speech which is summarized in the student handbook, *The Brunton*. Clear guidelines exist in the *Faculty Handbook* and the *Brunton* for appealing any perceived curtailing of free speech. Free inquiry is encouraged on the campus in the classroom, in research, and through public lectures and symposia, which encourage discussion about diverse views on controversial topics. In 2001-2002, for example, the Young Symposium featured a debate on the ANWAR project in Alaska and a student project brought the video "Journey to a Hate-Free Millennium" and a moderator for its discussion to campus.

The Library supports freedom of inquiry for the CSM community by:

- Implementing policies of confidentiality for patron communications pursuant to State legislation concerning library records;
- Providing open access to the World Wide Web, with minimal restrictions designed to accommodate the widest range of access to information for freedom of inquiry, given the Library's environment of shared computer resources and priorities on maintaining a safe working and study environment;
- Researching possible effects of post- Sept. 11 legislation on patron confidentiality and access to information.

Colorado law requires that all departments and agencies have a written electronic mail policy that applies to employees. CSM's policy addresses the rights and responsibilities of employees as it pertains to their use of e-mail services and was adopted by the Board of Trustees on May 7, 1998. The policy is generally interpreted to apply to student use of e-mail except for section D, which pertains to the application of public record statutes. The full policy can be found at
http://www.mines.edu/Academic/computer/policies/email.htm

All other Computing and Networking related policies emanate from the set of principles defined in section II-B of the Computing and Networking Resource and Responsible Use Policies and Guidelines. These principles set forth the bases for the subsequently defined policies, enforcement mechanisms and associated processes. The first two of the principles acknowledge that

1. Usage policies should protect and be in the best interest of the CSM community of users, and
2. Free inquiry and expression are essential elements of the academic enterprise. Usage policies should not infringe upon the academic freedom or rights to free speech of community members.

The full policy statement with related documents can be found at
http://www.mines.edu/academic/computer/policies/computerpolicies.html

g. "institutional commitment to excellence in both the teaching provided by faculty and the learning expected of students"

CSM is dedicated to excellence in both teaching and learning as demonstrated by a number of initiatives. First, we carefully screen candidates for faculty positions, both tenure-track and adjunct, to ensure that they are good teachers. Some departments/divisions now require a teaching portfolio and all require a statement of teaching philosophy for candidates. Sample classes are also often a part of the interview process as are meetings with students. Once a faculty member comes to CSM, he or she is evaluated by students every semester in every class. These evaluations plus classroom observations and other methods are integrated into the annual faculty evaluation process and, ultimately, into tenure and promotion and/or retention decisions. CSM employs relatively few adjunct instructors, many of whom have been affiliated with the institution for many years. In addition, graduate students are only rarely used as classroom instructors and then only under closely supervised conditions. A new policy regarding use of graduate students in the classroom can be found in the Resource Room. Annual faculty teaching awards recognize those faculty who excel in teaching.

Engineering education has long been recognized as a strength of CSM and is one of the six Areas of Preeminence for the School in the next decade. We have a nationally-

recognized Center for Engineering Education (CEE), which, in addition to performing cutting-edge research on engineering education, presents workshops on innovative teaching strategies and works with individual faculty members to improve their teaching. CSM faculty are very involved in the American Society for Engineering Education, many of them serving as officers in the Educational Research and Methods Division and other divisions over the years. For example over a dozen presentations at the ASEE annual meeting in June 2002 were made by CSM faculty. CSM faculty are also active in the educational efforts of their disciplinary societies such as American Society of Mechanical Engineers, IEEE, American Institute of Chemical Engineers, American Chemical Society, and American Physical Society.

CSM students are proud of the quality of their institution and its reputation for rigor and high standards. The qualifications for entering students are the highest in the state and among the highest for public institutions in the country. Students are introduced to the Colorado School of Mines culture in their first semester through the Freshman Success Seminar, CSM 101. In addition, each department has an advising program and there is a School-wide Advising Coordinator. Many students, both undergraduate and graduate, have an opportunity to work as part of a research team. Students are made aware of expectations through the bulletin and through their departments' web pages which include program goals and assessment results.

External constituencies also recognize the quality and value of a CSM education. Our placement rate remains consistently high, even in a weakened economy (in May 2002 68% of the 2001-2002 class was placed with an average salary offer to BS graduates of $48,000 compared to a national engineering average of $44,746), and recruiters worldwide recognize special qualities in our graduates. All of our engineering programs were recently reaccredited by the Accreditation Board for Engineering and Technology (ABET).

Three recent events demonstrate CSM's worldwide reputation for excellence: 1) Mines was selected from a global competition to help develop the Petroleum Institute in Abu Dhabi and has undertaken a 10 year partnership with the Abu Dhabi National Oil Company (ADNOC) to bring this project to fruition. 2) The Carnegie Foundation visited our campus as one of six engineering colleges they have selected as "exemplary." The Foundation plans to prepare a monograph on best practices in engineering education using CSM as one of their cases. 3) The Colorado legislature named CSM an Exemplary Institution, the only one in the State. This status allows CSM some flexibility with Colorado Commission on Higher Education regulations in return for a guarantee of continued quality.

Resource Room
Student Evaluation of Faculty
List of faculty and degrees
CEE annual report
CSM 101 syllabus
ABET accreditation document
Exemplary Institution Agreement
Policy on grad students in the classroom
Fall 2002 Admissions Report

Summary of Criterion 1:

Conclusion: We believe that the Colorado School of Mines has clear and publicly stated purposes consistent with its mission and appropriate to an institution of higher education and therefore meets the requirements for Criterion 1.

For each of the criteria, we have conduced a SWOT (strengths, weaknesses, opportunities, threats) analysis based on the information gathered during our continuous improvements efforts. These are summarized below for Criterion 1.

Strengths:
We believe that our traditions and reputation among the industries we serve are among the greatest strengths of the Colorado School of Mines. Our constituencies are loyal and clearly understand our role and mission because we keep them well informed about the School and its programs. Our processes are generally effective and flexible. Members of our community enjoy freedom of inquiry.

Weaknesses:
Our weaknesses include our current lack of a Strategic Plan including a proactive marketing strategy (also an Opportunity). Despite a general understanding of our mission, some constituencies, such as the Colorado Commission on Higher Education and the legislature, may not fully understand CSM's uniqueness.

As we begin to focus on the Areas of Preeminence, some faculty members may feel that they have not been fully heard in selecting these areas and thus may be concerned about how their research fits in. In addition, we could always do a better job of training TA's and supporting new faculty. We also have too many adjuncts in some departments/divisions, especially Engineering and Mathematical and Computer Sciences.

Opportunities:
We see a number of opportunities before us as we develop our Strategic Plan and its accompanying marketing plan. Our mission has recently been reviewed and re-approved by the State legislature, which leaves us free to explore the Areas of Preeminence which have been selected as our focus for development. We see these areas as means of expanding our mission without changing it. Our Center for Engineering Education has the potential to be the leading center of its type in the nation. Our ongoing curriculum review process helps us to continuously assess and improve our course offerings.

Threats:
The major threats we see involve national and State economic trends. We face the potential loss of faculty if budgetary problems continue and we are unable to keep pace with salaries and start up packages. We may also be affected if the number of students studying engineering nationally continues to decline. Finally, we are concerned that some of our traditionally strong departments may not have enough students in the future to remain viable.

Criterion 2: *"The institution has effectively organized the human, financial, and physical resources necessary to accomplish its purposes."*

a. "governance by a board consisting of informed people who understand their responsibilities, function in accordance with stated board policies, and have the resolve necessary to preserve the institution's integrity":

The Colorado School of Mines is governed by a Board of Trustees consisting of seven people appointed for staggered four-year terms by the Governor of Colorado with the advice and consent of the Senate. "At least four and not more than five of the appointed members of the board shall be graduates of the Colorado School of Mines upon each of whom a degree has been conferred by its board of trustees not less than ten years prior to his appointment." (23-41-109) The Board, therefore, is largely composed of people intimately familiar with Mines and interested in its continued success. In addition to the seven appointed members of the Board, an eighth member is a CSM student (full-time junior or senior) elected by the student body for a one-year, non-voting term. The Trustees meet on the third Friday of each month. In addition, they hold a two and one-half day strategic retreat each year with members of the Administration and faculty. Copies of the Board minutes for the past five years as well as biographies of the current Board members can be found in the Resource Room.

As part of SB01-229 (Exemplary Institution Bill), the General Assembly of the State of Colorado amended the Colorado Revised Statutes to include a section designating the Colorado School of Mines as an Exemplary Institution and authorizing the development of a performance contract between the Colorado School of Mines and the Colorado Commission on Higher Education. One component of this change was the authorization to create advisory members to the Board "to sustain and enhance the role and mission of the Colorado School of Mines. Any additional members of the board of trustees shall serve as nonvoting members of the Board and be representative of national and international industries and research and academic institutions. The role of any such advisory members shall be to improve the trustees' opportunities to develop and enrich the academic and research programs of the institution." The Board is currently in the process of deciding on the composition of the advisory board and identifying its members.

Resource Room
BOT Retreat Agendas
BOT by-laws
BOT monthly agendas and minutes
BOT biosketches

b. "effective administration through well-defined and understood organization structures, policies, and procedures":

An organization chart for the Colorado School of Mines can be found in Appendix C. Basically, the university structure consists of the Board of Trustees, the President, and the Vice Presidents for Academic Affairs, Student Life, Finance and Operations, and Institutional Advancement as well as the individuals and departments that report to them. Policies and procedures are delineated in the *Faculty Handbook* (for academic and administrative faculty) and the *State Classified Handbook* (for classified staff), as well as on the websites of the various campus entities.

Policy changes are disseminated across campus through the annual *Faculty Handbook* change process, email lists (department heads, assistants, faculty, staff, students), Faculty Forums sponsored by the Faculty Senate, the weekly on-line newsletter, *Campus in Brief*, bi-weekly department head meetings, the school newspaper, *The Oredigger*, and through the school magazine, *Mines Magazine.*

Board of Trustees

By State statute (23-41-104) "the board of trustees has the control and management of the Colorado School of Mines and of the property belonging thereto, subject to the laws of this state, and may make all needful bylaws and regulations for the government of said board and for the management and government of the Colorado School of Mines not inconsistent with the laws of this state." The Board operates under a set of bylaws, a copy of which will be found in the Resource Room. The Board approves of all changes to the *Faculty Handbook*. Section 10 of the *Handbook* consists of various Board-promulgated policies.

President's Office

The President's Office, working with the Board of Trustees, sets the strategic direction for the School and establishes campus policy. The President's Office consists of the President, a Special Assistant to the President, and an administrative assistant. In addition, the Legal Services and Public Affairs offices report to the President, as do the four Vice Presidents (Academic Affairs, Finance and Operations, Institutional Advancement, and Student Life).

The President meets weekly with the four Vice Presidents, and has weekly individual meetings with each as well as the Executive Director of the Alumni Association. The President and Vice Presidents recently held a two-day planning Retreat, which will be repeated every six months. The President regularly participates in monthly meetings of the Chief Executive Officers at the Colorado Commission on Higher Education and is a member of the Governor's Blue Ribbon Panel on Higher Education. The President is also on the Advisory Board for the National Renewable Energy Laboratory and the Advisory Council of Red Rocks Community College. The President meets with alumni and friends of the School throughout the World to build support for the institution.

Office of the President: The Special Assistant to the President, in addition to providing staff support to the President, works in the area of campus relations and oversees a number of campus events. In addition, the Special Assistant to the President provides staff support for the Board of Trustees. The administrative assistant manages the daily functions of the office as well as logistical coordination of campus events.

Office of Legal Services: The Office of Legal Services provides legal counsel to the President and the Board of Trustees, as well as to other campus personnel and projects as assigned. The General Counsel is the principal author of the *Faculty Handbook* and participates on the *Faculty Handbook* Committee as a non-voting member. The Associate General Counsel oversees immigration issues for new faculty.

Office of Public Affairs: The Office of Public Affairs interacts with the media, providing information on the School, its faculty, research and events. The Office of Public Affairs personnel also assist faculty and staff in initiating and responding to media contact. In addition, the office produces two major publications, the quarterly *Mines* magazine for the campus community and friends of the School (published in conjunction with the Alumni Association), and *CSM Update*, a research newsletter published each semester. The Office also keeps the campus community informed of activities and events through a weekly electronic newsletter, *Campus in Brief*.

Vice President for Academic Affairs

The office of the Vice President for Academic Affairs manages curriculum and academic planning, departmental budget requests and allocations, undergraduate student issues, faculty affairs issues, space issues, various committees and several annual events. All of the department heads/division directors report to the VPAA who completes their annual evaluations, allocates their annual budgets, authorizes searches for new faculty, examines their annual academic plans, and chairs bi-weekly meetings of the group.

In addition, the VPAA has oversight of the Registrar and the directors of WISEM (Women in Science, Engineering, and Mathematics), the Office of International Programs, EPICS, the Center for Engineering Education, and the McBride Honors Program. The VPAA office also supervises the Abu Dhabi Petroleum Institute initiative and serves as an institutional liaison to several committees of the Colorado Commission on Higher Education (as do other CSM administrators). The VPAA chairs the Strategic Planning Task Force and deals with undergraduate student issues including complaints and course substitution sign-off. The Dean of Graduate Studies and Research and the Associate Vice President for Academic Affairs report to and work with the VPAA in covering the duties of the office.

The Associate VPAA chairs the *Faculty Handbook* Committee, the Higher Learning Commission Steering Committee, the Compensation Advisory Committee, the Calendar Committee, and serves on the University Club Policy Committee, and the Space Planning and Allocation Committee. In addition, this office deals with a number of faculty affairs issues including teaching awards, faculty searches and hiring, faculty evaluations, faculty salary determinations, promotion and tenure issues, sabbatical requests and follow up, retirements/transitional retirement agreements and emeritus designations, faculty complaints, and summer course planning and authorization.

The Executive Assistant to the VPAA provides support to the committees enumerated above and oversees the planning for annual events such as commencement, the annual Faculty Conference, New Faculty Orientation, and the April Faculty Forum at which teaching and research awards are presented. This person also supervises support staff, maintains the schedules for the VPAA and AVPAA, updates the Procedures Manual and maintains the office's website.

The Office of Graduate Studies works with academic departments at CSM to administer graduate education in engineering and applied science. The office handles graduate admissions, manages graduate recruiting programs, maintains student records and

certifies students for graduation. The office works with academic departments to coordinate student leaves and track academic progress. Graduate Office personnel ensure that institutional policies are administered, published and communicated to students and faculty. The Office provides academic departments with financial support for graduate students in the form of fellowships and teaching assistantships.

Vice President for Finance and Operations

The Vice President for Finance and Operations (F&O) manages Plant Facilities, Human Resources, Fiscal Services, Purchasing, Research Services, Environmental Health and Safety, Budgeting, Information Services, External Affairs, and Institutional Research.

The F&O Office has an extensive web site that includes a wide range of policies, procedures, resources, links and self-service applications at http://csmis5.mines.edu/fo/. This web site is managed by a team focused on improving customer services and includes a "knowledge base" search feature. Self-service applications include on-line inquiry into campus accounts and a "web for employees" site where CSM employees can view and edit, where appropriate, their personal data for payroll deductions, benefits, and information to be listed in the CSM directory. Employees now have electronic access to their pay stubs and personal leave history and reporting.

The Office conducts periodic outreach events for its campus constituencies to answer questions, address concerns and share new information. Directors of the various administrative units meet regularly to discuss items of common interest. An annual director retreat provides the opportunity to review the prior year's successes and to prioritize ideas for implementation in the following year.

Plant Facilities: In recent years, Plant Facilities has undertaken a number of initiatives, including development and implementation of an energy management program, an automated work-order system via the web, and state-of-the art telecommunications infrastructure and support. An extensive web site makes services and information readily available to the campus community, http://csmis5.mines.edu/plant/.

A space change process was established in Spring, 2002 in order to maintain administrative oversight and control over space use and allocation. This process also provides a process for funding of special projects and maintenance of the facilities space inventory database. The process requires submission of an application for any space change or project funding request. This application is then reviewed by a committee comprised of facilities staff, department heads and other campus representatives, which makes to the VPAA.

A campus master planning effort is underway. An informational database of space assignment has been created to form a comprehensive space inventory and this is linked to a graphical database of floor plans. A space model is being developed to project space needs (surpluses, deficits) based upon variables which are unique to the institution. The space needs will determine the campus facilities needs. A space model, campus land use

and facilities plan have been drafted, and a formal master plan document is due to be submitted to the Colorado Commission on Higher Education by July of 2003.

Human Resources: A recent outside consultant's review of human resources and payroll programs and processes is posted on the F&O web site (http://csmis5.mines.edu/fo/). Several recommendations for improving the HR function are in various stages of implementation. Particular mention must go to the recent creation of a comprehensive new employee orientation program, a staff development center including a physical facility upgrade and a program of training classes aimed primarily at administrative support personnel at CSM, and continuing work by an interdisciplinary team to implement continuous improvement projects related to payroll. HR has a growing web site, http://csmis5.mines.edu/hr/, providing the campus with information, programs and self-service applications.

Fiscal Services: The office, in collaboration with Information Services has made account information available to the various campus constituencies via the web. The office has also added significant content to its web site at http://csmis5.mines.edu/fiscal_services/.

Purchasing: The CSM Purchasing unit manages within prescribed parameters of the State's rules and regulations governing purchases. In recent years, the unit has implemented a procurement card system for authorized campus users, increased the small dollar purchase limit from $500 to $1,999, implemented a web-based bidding system for all bids issued by the School, and improved bid procedures resulting in a five-fold increase in bid solicitations. The unit has a web site at http://csmis5.mines.edu/mmgmt/ which includes a link to the State Purchasing Office price agreements.

Research Services: This unit supports the School's research mission and programs with proposal preparation, contract negotiation, and account setup and closeout. The unit has a comprehensive web site at http://csmis5.mines.edu/ors/. A database houses information regarding proposals submitted, projects in effect, and status of accounts during closeout. In the near future, information in this database will be available to researchers via the web.

In recent years, the research services unit has eliminated a backlog of old, outstanding research accounts. Current procedures assure that there are no principal investigator deficits, and sponsor debt owed to CSM is actively pursued. Due to aggressive customer service goals and standards, the proposal preparation staff has never missed an agency-directed deadline for submitting proposals.

Environmental Health and Safety: This unit has implemented a comprehensive program giving CSM state-of-the art infrastructure to promote safe storage and handling of hazardous materials, dealing with incidents, providing training, and complying with state and federal requirements. The EHS web site makes services and information readily available to the campus at http://www.mines.edu/Admin/support/ehs/. Components of this comprehensive program include database tracking of student and faculty health and

safety training, campus-wide chemical inventory with on-line search capability, and safety seminars for all new graduate students.

Information Services: This unit supports administrative computing at CSM, including financial reporting, student information, human resources and payroll, and desktop applications and equipment. Activity in recent years has focused on the implementation of web-based self-service applications for students, faculty and staff, including on-line registration, class lists, grade reporting, account status look-up and access to data related to payroll deductions, benefits, information to be listed in the CSM directory, and more. The IS web site is comprehensive, http://csmis5.mines.edu/is/.

External Affairs: Much of the external affairs activity in recent years has focused intensively on efforts to receive Exemplary Institution status for the School. In addition, public higher education in Colorado has been subject to a number of studies and reviews involving the Colorado Commission on Higher Education, the legislature and its committees, and a Blue Ribbon Panel established 2 years ago by Governor Owens. The Vice President for Finance and Operations has participated actively in these studies and continues to support the work of the Blue Ribbon Panel. An External Affairs web site, http://csmis5.mines.edu/fo/external_affairs1.shtm, links the campus to a variety of legislative and information resources.

Institutional Research: The Institutional Research office provides support for a variety of planning, reporting and research needs. Recently, the office has assisted in the statewide study of higher education, the campus master plan, accreditation visits, and the implementation of a new remedial education program.

At this time, F&O is in the process of recruiting a new Director of Human Resources and a Controller. The current HR Director is retiring at the end of November, and the Controller has taken a position with another higher education entity in the state.

Vice President for Student Life

The Student Life Division is made up of the following departments:

Admissions – The CSM Undergraduate Admissions Office is responsible for the admission of all undergraduate degree students including freshmen, transfer, and international students, and all high school students taking courses at CSM as non-degree students. The Office is also responsible for all recruiting and outreach programs for attracting these students to CSM including publications, high school visits, on-campus visitation programs, individual tours and campus visits, and other programs of this nature. Information for prospective students about CSM policies, procedures, and programs is provided on the CSM Web pages, in annual publications, and through presentations in high schools and colleges.

Athletics – The CSM Department of Athletics is responsible for managing the intercollegiate athletic programs at CSM, and for managing and developing the physical education courses that are a required part of the CSM curriculum as well as club and

intramural sports and the Outdoor Recreation Center. CSM currently offers 16 varsity sports (10 for men and 6 for women—the student body is approximately 75% male, 25% female) and offers intramural competition for men and women students in 13 different sports. Approximately 16 percent of CSM undergraduate students participate in varsity sports and over 50 percent are involved in intramural sports. The Department of Athletics is also responsible for managing compliance with NCAA requirements for student athletes and intercollegiate athletic programs.

Career Services – The CSM Career Center is responsible for providing comprehensive career planning, career counseling, and employment services for CSM students. The Career Center takes a leadership role in maintaining information regarding current labor market trends, as well as relevant information and resources about graduate and professional schools, and internship, cooperative education, and full-time, entry-level employment opportunities. The Career Center manages the Cooperative Education Program, and the on-campus interviewing program. The Career Center maintains a website that provides information about policies and procedures, access to job postings employer websites, career resources, and the on-campus interviewing system. The Career Center collects, and annually reports employment and graduate school data from all undergraduate and graduate degree recipients, and provides services to all graduates up to 18 months after graduation.

Financial Aid – The CSM Financial Aid Office serves all students on the CSM campus, both undergraduate and graduate, and administers a financial assistance budget of approximately $26.0 million ($18.2 million for undergraduates and $7.8 million for graduate students). Undergraduate financial assistance includes all Federal and State funds, as well as CSM Foundation and general income funds. Graduate financial assistance includes all fellowships and assistantships as well as Federal and other loan funds.

In administering financial assistance funds, the CSM Financial Aid Office strives to make CSM financially accessible to students and families regardless of financial circumstances, to recognize students with outstanding academic achievement, and to promote the general goals and mission of CSM, including student diversity, retention, and graduation as well as student participation in a variety of activities.

Minority Engineering Program – The CSM Minority Engineering Program (MEP) was established in 1989 to recruit, retain, and graduate ethnic minority students. The MEP staff consists of a Director, Assistant Director, and one support staff person. MEP recruiting and financial assistance efforts are coordinated with and supported by the Admissions and Financial Aid offices.

Since MEP was started, undergraduate minority student enrollment has grown from 8 percent to more than 13 percent. The increase and success of these students on campus can be attributed to MEP's comprehensive approach that provides minority students with a supportive and nurturing learning environment. However, the MEP program has program objectives designed to increase minority representation even more by: 1) increasing high school recruiting in new and current markets, 2) increasing pre-collegiate

pipeline of talented minority students, 3) increasing involvement with community colleges and transfer students, 4) increasing financial support for MEP students, 5) increasing persistence rates for current undergraduate minority students, and 6) establishing an MEP advisory board.

Public Safety – The CSM Department of Public Safety is a full-service law enforcement agency with a philosophy of community oriented policing. The department provides law enforcement services along with comprehensive programs of personal safety/security, facility security, crime prevention, parking, and related public safety services. Part of the mission of the department is to help ensure that the Colorado School of Mines Community remains a safe and pleasant place to learn, live, and work. The department consists of one Director/Chief of Police, six full time Police Officers, three part time Police Officers, five Reserve Police Officers, and an Administrative Assistant. Information for services provided and programs is made available on the CSM Web pages, the student handbook, and the student directory as well as through presentations to students and staff.

Student Development – CSM Student Development Services is responsible for providing a variety of personal, academic, and career counseling services, as well as educational and development programs for CSM students. In addition to providing professional, short-term individual counseling that addresses mental health concerns ranging from crisis intervention to mild anxiety, Student Development Services also provides useful articles and pamphlets on its website, and referral services for students whose needs are beyond the scope of services offered, including an enhancement to the mental health benefits provided to students on the CSM Student Health Benefit Plan. Outreach programs focus on the developmental, personal, educational, and cultural needs of CSM students are provided through presentations in classes and workshops

Student Life – The CSM Student Life Department, has responsibilities for the following areas: 1) Maintenance and operation of the CSM Student Center, 2) operation of the CSM Bookstore, 3) operation of CSM food services, 4) maintenance and operation of all CSM-owned residence halls, fraternity and sorority houses, apartment complexes, and other Student Life properties on the CSM campus, 5) supervision of all CSM sponsored clubs, activities, and organizations including intramurals, Outdoor Recreation Center, and fraternities and sororities. The Student Life Department produces the CSM student handbook, the *Brunton*, administers the CSM alcohol policy, develops and administers all policies and procedures for CSM student housing including handbooks and contracts. The Student Life Department has an operating budget of about $6.0 million from student rents and fees, and other fees charged for the use of Student Life services and facilities.

The following are recent and anticipated future construction projects that the Student Life Department has funded or will fund by the issuance of tax-free revenue bonds:

> **New Student Center** – In 1996, approximately $7.8 million was spent to renovate and add approximately 25,000 square feet of space to the CSM Student Center. This renovation included a new food court, more meeting

areas, both large and small, and additional office space for staff and students. In 2000-2001, approximately $3.2 million was spent to construct a second addition to the Student Center that houses the Admissions, Financial Aid, Registrar, Career Services, and Student Development offices as well as the CSM Cashier. This addition allows students to conduct much of their business with Student Life offices in a convenient arrangement in one location.

Upgrading student housing – Student Housing at CSM consists of the following CSM owned buildings and facilities (noted beside each building or facility is its current renovation or construction status):
1.Morgan Hall – An 89-bed, traditional residence hall housing men and women students. Morgan and Thomas halls were renovated in 2000 at a combined cost of about $1.8 million.
2.Thomas Hall – An 89-bed, traditional residence hall housing men and women students. Renovated in 2000.
3. Bradford Hall – A 102-bed, traditional residence hall housing men and women students. Bradford and Randall halls are scheduled for renovation in the 2003-2004 academic year at a combined cost of $2.4 million.
4. Randall Hall – A 102-bed, traditional residence hall housing men and women students. Renovation is scheduled for the 2003-2004 academic year..
5. Prospector Village – A 70-unit, 140-bed apartment complex housing married CSM students and families. Scheduled for demolition in the 2003 - 2004 academic year (please see the following section regarding new housing construction and the upcoming construction bond).
6. Mines Park – A 112-unit, 172-bed apartment complex for undergraduate and graduate students. Constructed in two phases, the first in 1999 and the second in 2001, at a cost of $5.0 million.
7.Sigma Nu and Phi Gamma Delta Fraternity houses – In 2001, the CSM Student Life division purchased the Sigma Nu Fraternity house and constructed a new house for Phi Gamma Delta Fraternity at a total cost of about $2.0 million. These houses are leased to each of the fraternities.

Bond Issue and New Construction – In the fall 2002, the CSM Student Life Division anticipates that it will raise approximately $25.0 million through the sale of revenue bonds. This money will be used for the following new construction projects:

1. Three Sorority Houses – In the space currently occupied by Prospector Village, three new sorority houses will be constructed at an estimated combined cost of $4.0 million. CSM will own these houses and lease them to the three sororities on campus.
2. Mines Park – Approximately 112 new apartment units housing 170 students and other expanded facilities will be constructed in the current Mines Park Housing complex at an estimated cost of $17.0 million..

3. CSM Cafeteria – Approximately $1.0 million will be spent to modernize the CSM cafeteria focusing on the kitchen area, but including the eating and serving areas.
4. Campus One-Card System – Approximately $1.0 million will be spent on the Campus One-card System. This system will provide for computer keyed access to residence halls and facilities, as well as a debit card system for laundry rooms, vending machines, the CSM Bookstore, and the CSM dining hall and food as well as other debit/credit card merchants in Golden.
5. Bradford and Randall Residence Halls – As noted in a previous section, both Bradford and Randall residence halls are scheduled for renovation in the 2002-2003 academic year at a combined cost of $2.4 million each.

Vice President for Institutional Advancement

The purpose of the Office of Institutional Advancement (OIA) is to advance public understanding and philanthropic support of the School's educational mission by producing both unrestricted and designated gifts to CSM.

Within OIA, there are two associate vice presidents, the Associate Vice President for Development and the Associate Vice President for Marketing and Advancement Services. Annual Giving, Major Gifts, Planned Giving and Corporate and Foundation Relations fall under the development category; Advancement Services and Development Research fall under the advancement services.

All philanthropic gifts made in support of CSM are received and stewarded by the CSM Foundation, which is a non-profit organization. The Foundation charges a management and program fee of 2% on all accounts.

c. "qualified and experienced administrative personnel who oversee institutional activities and exercise appropriate responsibility for them":

"Minimum qualifications for each administrative faculty position shall be determined by the hiring authority for that position after appropriate consultation with the Office of Human Resources. Most administrative faculty positions will require at least a baccalaureate degree plus appropriate experience relevant to the job assignment." (*Faculty Handbook* Section 4.6). A list of administrative faculty, their job titles, and their degrees can be found in the Resource Room.

CSM is part of the State of Colorado classified system and many important positions on campus are filled by classified staff including the Manager of Planning and Construction, the Environmental Health and Safety staff, accountants, and departmental assistants. Open, organized searches are held for most (if not all) of the administrative and supervisory positions on campus, both classified and exempt.

As recommended by the *Faculty Handbook* Committee and approved by the Board of Trustees in June 2002, we are implementing an evaluation process for administrative faculty in the 2002-2003 academic year (*Faculty Handbook* section 7.1).

Resource Room
Administrative Faculty list
Faculty Handbook

d. "systems of governance that provide dependable information to the institution's constituencies and, as appropriate, involve them in the decision-making processes":

A variety of systems of governance ensure that information is provided to the institution's constituencies and that they are involved in decision-making processes, as appropriate. Campus communication in general has been improved with the use of e-mail, list serves, and ready access to the School's website.

- All meetings of the Board of Trustees are open and publicized ahead of time. Board minutes are also open records. Board policies are included in the *Faculty Handbook* which is available on the Academic Affairs website (http://www.mines.edu/Academic/affairs/fachandbook/).
- Policies and procedures are found in the *Faculty Handbook* or on the Academic Affairs website. A new Academic Affairs Policy Manual is under development and will posted on the website soon.
- The Senate posts minutes on its website and holds monthly Faculty Forums to present information or gain input on faculty-related issues.
- The department heads/division directors meet weekly. One meeting out of two is chaired by the VPAA; the other is an "off line" meeting. A great deal of campus information is funneled through the DH/DD group to their faculty.
- Three councils—Undergraduate, Graduate, and Research—make decisions related to curriculum and other relevant issues on the behalf of the faculty they represent.
- The Administrative Faculty Council meets regularly and holds a luncheon meeting once a semester to solicit ideas from the administrative faculty and to inform them of current issues.
- The student government entities ASCSM and GSA provide information to their students and gather student opinion on campus issues. They hold regular meetings in which issues of concern to students are raised, discussed, and decided on. Graduate and undergraduate students also serve on a variety of campus committees including the Technology Fee Committee, the Calendar Committee and the Student Affairs Committee.
- An Executive Committee (3 administrators, 3 members of the faculty senate, 3 department heads/division directors) meets monthly to share information and discuss issues of interest or concern to the academic community.
- Classified staff have a list serve. In addition, the Assistant to the VPAA meets regularly with the department/division assistants to share information. A new training center in Guggenheim Hall offers information to staff about various campus policies and procedures.

e. "faculty with educational credentials that testify to appropriate preparation for the courses they teach":

A list of all full time faculty, including library faculty, instructors, lecturers and tenured and tenure-track faculty along with their degrees and the year they started at CSM can be found at the back of the undergraduate and graduate bulletins. A list of all faculty

members, including adjuncts, with their degrees can be found in the Resource Room. Nearly all tenured or tenure-track faculty have Ph.D.'s in areas relevant to their teaching. Instructors and lecturers generally have at least a Masters degree in a relevant field. In addition, the websites of CSM departments generally include additional information about faculty members.

CSM traditionally staffs a relatively small percentage (13%) of its courses with adjunct professors. Many of these adjuncts have taught at CSM for many years and are highly qualified. They are evaluated by their students each semester and are terminated if their evaluations are consistently low. Adjuncts are often hired to teach specialized courses for which it is impractical to hire a full-time faculty member, e.g., foreign language courses, environmental law, cultural anthropology. In some cases, adjuncts have special knowledge or experience that enhances student learning. For example, adjunct faculty with considerable industrial experience may teach design courses. However, some departments/divisions, most notably Mathematical and Computer Sciences and Engineering, currently are forced to rely too heavily on adjunct faculty, largely as result of rapid enrollment growth. We are making efforts to reduce the reliance on adjuncts in these departments by hiring more full-time faculty, both on the tenure-track and at the instructor and lecturer ranks.

All teaching faculty are required to administer the School-wide student evaluation survey in every course every semester. A compilation of evaluation results from the past three years can be found in the Resource Room. Their department head/division director also formally assesses all full-time faculty members each year. The evaluation process is described in the *Faculty Handbook*, Section 7.

Resource Room
Undergraduate &
Graduate Bulletins
Faculty list
Student evaluations of faculty

f. "a sufficient number of students enrolled to meet the institution's stated educational purposes":

CSM's small size makes it unique among state-supported schools. However, it remains small by choice, as articulated by the Board of Trustees in its November 2001 meeting. All of the programs at the School have sufficient enrollment to meet our stated educational purposes. The Registrar's Report, which is published every semester, contains enrollment data for all undergraduate and graduate programs.

The Colorado Commission on Higher Education (CCHE) annually reviews academic programs at public higher education institutions to identify low demand programs. CCHE policy defines a low demand undergraduate degree program as one that fails to graduate at least 10 students in the current year or a total of 20 students in the past three years. The benchmark for masters degree programs is three graduates per year or a total of five in the past three years. The doctoral program benchmark is one graduate per year or a total of three in the past three years. Each institution may exempt up to five undergraduate degree programs central to the institution's role and mission.

CCHE reviewed low demand programs most recently in May 2002. In this report, two CSM programs - Geological Engineering Professional Degree and Geophysical Engineering Professional Degree - are listed as exempted from the CCHE policy. Four CSM degrees are operating below the CCHE benchmarks and require CSM Board of Trustees action by 2004. These are Master of Science degrees in Chemistry and Physics, and Ph.D. degrees in Geological Engineering and Geochemistry.

Resource Room
Registrar's Reports for 5 years
CCHE Low Demand program memo

g. "provision of services that afford all admitted students the opportunity to succeed":

CSM has high admissions standards and rigorous and demanding curricula. When a student is admitted, CSM does everything it can to ensure that student's success. This begins with a CCHE-mandated remediation process in which students whose SAT or ACT scores in math or English fall below a certain level are advised to seek tutoring from either Academic Services or the LAIS Writing Center. In 2001-2002, the first year of the program, only 30 students needed remediation and of these 22 completed it successfully. Five are enrolled for the course in the fall of 2002, one student has withdrawn from CSM, and two students remain enrolled but have not taken the required course.

In addition, CSM provides financial aid to a large percentage of our students. In the 2001-2002 academic year, the CSM Financial Aid Office awarded approximately $18.2 million in financial assistance to undergraduate students. About 74 percent of undergraduate students received need-based financial aid, and about 85 percent of all undergraduate students received financial assistance form one source or another, including merit, or non-need based, scholarships.

First year students are provided with a number of services to help them succeed. All first semester students are required to take CSM 101, a freshman success seminar designed to introduce them to college life, provide them with guidance on classes and majors, and provide them with a faculty mentor (the student-mentor ratio is approximately 12:1). The first-year required Physical Activity courses focus on wellness, stress relief, and other issues pertinent to adjustment to college life. In addition, freshmen are allowed to drop courses until the end of the semester. Since all freshman schedules are pre-designed because freshmen take a common core of courses, first year students are guaranteed enrollment in courses that are required for graduation.

A range of services is provided for all CSM students through the Academic Services office (http://www.mines.edu/stu_life/academicservices/) including academic support programs as well as educational services. Academic support programs, tutoring and Academic Excellence Workshops served over 800 students through 3,010 contacts in 2001. In addition, the LAIS Writing Center (http://www.mines.edu/academic/lais/wc/index.html) offers help in writing and preparing presentations to both undergraduate and graduate students. The International Student and Scholar Services Office (http://www.mines.edu/Stu_life/intl_stu/) provides a variety of

services to the international community at CSM including international student orientation, housing assistance, academic advising, and sponsor support. The Office of International Programs provides assistance to students wishing to study abroad. Information on all of these services can be found in the Resource Room. A faculty-staffed Readmissions Committee works with students who are suspended for academic reasons to try to ensure that they will succeed if they are readmitted.

The School is always concerned with retention of admitted students. In 1998 a large-scale retention study was completed which made a number of recommendations that have been adopted by CSM including enhanced academic advising, enhanced tutoring programs, expanded career services, more student activities, a financial aid optimization program, and a yearly persistence and retention report for the CSM Board of Trustees. Our current six-year graduation rate is 64 percent (61 percent graduated in five years), which compares favorably with the 50.9 percent reported for colleges nationwide by American College Testing, but not quite as high as the target proposed by the Board of Trustees of 66 percent. Among a group of peer institutions with comparable programs, CSM's graduation rate is in the middle of the group (see Table 2).

Table 2. CSM Graduation Rates Compared to Peer Institutions

Institution	Graduation Rate in 1999 (six years)
Colorado School of Mines	**63.8**
Rose-Hulman Institute of Technology	71.2
University of Colorado-Boulder	63.6
Polytechnic University	53.3
Rensselaer Polytechnic Institute	73.2
University of Missouri-Rolla	54.8
Michigan Technological University	65.8
Colorado State University	59.9

In the fall of 2001, a consultant was hired to conduct a climate study of CSM. The assessment focused on the broad question: "What is the learning environment for students on the CSM campus and more specifically what is the climate like for students of diversity?" The assessment process was qualitative, including campus observations, reviews of print and electronic media, and campus interviews. A copy of the report will be found in the Resource Room.

The Career Center (http://www.mines.edu/stu_life/career/) provides complete and accurate data on the immediate outcome of education received at CSM by reporting annually on 100% of the graduates in a comprehensive manner, and following them with three updates on status at six-month intervals after graduation. The Career Center hosts a number of recruiters on campus each year (107 in 2001-2002) and, in addition, holds both a fall and spring Career Day. The fall Career Day usually attracts over 150 exhibitors. Of the 2001-2002 graduating class, 68% were placed by May with an average salary offer to BS graduates of $48,500 (compared to the $44,746 average for engineering graduates in 2002). The class of 2001 is now 98% placed. Mines also saw the largest percentage

ever of BS graduates (22%) report that they were pursuing graduate or professional education.

This is the third year that the Colorado School of Mines has had the benefit of an Internship Development Coordinator. The goal of this position is to develop partnerships and working relationships with employers leading to increased summer employment and internship opportunities for our students.

In 1989 CSM established the Minority Engineering Program (MEP) to recruit, retain, and graduate African Americans, Asian Americans, Native Americans, and Hispanics. Since then, undergraduate minority student enrollment has grown from 8 percent to more than 13 percent. The increase and success of these students on campus can be attributed to MEP's comprehensive approach that provides minority students with a supportive and nurturing learning environment

The mission of the Women in Science, Engineering, and Mathematics (WISEM) Program is to enhance opportunities for women in science and engineering careers, to increase retention of women students, faculty, and staff at CSM, and to promote equity and diversity in higher education. WISEM provides a number of activities to help recruit female students and retain them once they arrive on campus.

All of these efforts were enhanced by the recent curriculum reform initiative (1994-present) which :

- updated the attributes describing the graduates of this School, as documented in the *Profile of the Colorado School of Mines Graduate*, in alignment with the evolving expectations of our constituencies, and in alignment with our evolving mission;
- revised the entire curriculum in accordance with the expectations implied in the *Profile* and with departmental program goals;
- executed the above in a mode that leads to an institution-wide system of continuous improvement.

Resource Room
Remediation policy
CSM 102, PA 101, 102 syllabi
Retention Study
Campus Climate Study
Materials from Student Services
Materials from Academic Services
Materials from MEP
Career Center annual report
WISEM annual report
Materials from International Office
CRSC Documentation

h. "a physical plant that supports effective teaching and learning":

The Mission of the Plant Facilities Departments states: "Through fiscally responsible, resource conscious, facilities management, planning, and operations, the employees of the Colorado School of Mines Plant Facilities Department will continually assist the entire campus community by identifying, understanding, and meeting the ever changing

challenges placed upon the institution's learning environment." To accomplish this mission, the Plant Facilities Department employs 100 full time employees. The main areas of operation are outlined here.

Preventative Maintenance and Operations:
Both the Plant Operations and Campus Services Divisions provide ongoing preventative and corrective maintenance services. Annually these two operations complete over 4,000 work orders, 1,060 of which are scheduled preventative maintenance. Plant utilizes state-of-the-art computerized facilities management, work order and accounting software. Work orders can be submitted 24 hours a day, 7 days a week, via phone, fax or email. Plant Facilities has an advanced web site at http://csmis5.mines.edu/plant/ with many on line forms, which provide easy customer access to services. Plant Facilities personnel are on the campus 20 hours a day - excluding Saturday and part of Sunday – during regular service hours of 8 a.m. to 4:30 p.m. The main office is capable of responding between 7:30 a.m. and 5:00 p.m.

Facilities Improvements and Construction
Through their combined efforts Plant Operations, Campus Development and Campus Services annually manage and complete an average of $200,000 in small academic support improvement projects and $400,000 in institutionally funded major improvement projects.

The Campus Development Division is continually involved managing ongoing campus-wide State funded Controlled Maintenance building system improvement projects, along with State funded Capital Construction building renovations and new construction. The Controlled Maintenance expenditure averages $1 million a year, while the Capital projects have ranged from $250,000 to $23 million per year. Plant Facilities is currently involved with the construction and completion of the 60,000 square foot General Research Laboratory and Geology Museum Building scheduled to open Fall 2002.

Plant Engineering and Energy Management
Plant Engineering provides utility and building system management, automated building controls operation and management, energy management, and operational/construction consulting services to all Plant Facilities Divisions and the campus community in general.

Campus Communications
The telecommunications staff of three provides the entire campus community with an array of voice communications services. These include telephone repairs, moves, adds and changes, centralized voicemail systems, local calling service, long distance calling service, detailed billing, toll free 800 service, annual printed directory, centralized switchboard, automated directory services and customized call routing.

Telecommunications also provides and manages special circuits and other projects. Some of these services include video conferencing circuits, modem pooling, fiber optic and copper cable plant management, and related campus project planning and communications consultation.

A campus master planning effort is underway. An informational database of space assignment has been created to form a comprehensive space inventory and this is linked to a graphical database of floor plans. A space change process is currently being implemented. A space model, campus land use and facilities plan have been drafted, and a formal Master Plan document is due to be submitted to the Colorado Commission on Higher Education by July of 2003.

Resource Room
Space Allocation information
Current Master Plan
Space Change Request forms

i. "Conscientious efforts to provide students with a safe and healthy environment":

The Colorado School of Mines endeavors to provide its students with a safe and healthy environment.

Health

- *Wellness Center* – a $25 million dollar comprehensive Wellness Center is being planned with funding coming from a combination of student fees and public and private funds.
- *PA 101 and 102*—these required introductory physical activity courses have recently been reorganized to focus on wellness, stress relief, drug and alcohol issues, etc.
- *Stress Free Zones* are sponsored by Student Development Services during finals.
- *The Student Health Center* provides a primary care facility for undergraduate students. In 1999 a dental clinic was added that provides routine dental services to students.
- *Health Insurance*—CSM offers an outstanding comprehensive health benefits plan to all undergraduate degree students at a cost well below comparable individual health insurance plans. There is no preexisting condition exclusion, and the lifetime maximum benefit is $2.0 million. All CSM undergraduate degree students are required to have health insurance either through CSM or another provider.
- *Extracurricular activities*— Approximately 20 percent of CSM undergraduate students are active in the Greek system (seven fraternities and three sororities), 16 percent participate in varsity athletics, 50 percent are involved in intramural athletics, and 32 percent rent equipment from or participate in activities organized by the Outdoor Recreation Center. Overall, about 80 percent of CSM undergraduate students are involved in one activity or another.

Resource Room
Emergency Plan
Faculty Handbook

Safety

- *Student housing upgrade*-- The CSM Student Life Division has spent approximately $20.0 million in the last six years on various renovation

and new construction projects involving the Student Center, residence halls, and other student facilities. The Division is currently in the process of raising about $25.0 million through the sale of revenue bonds to finance a variety of construction projects. These projects are detailed in the section under Student Life.

- *Environmental Health and Safety* provides training for graduate students.
- We have a *Safety Committee.*
- We have a *Biosafety Committee.*
- There is an *Emergency Plan* in effect, which will shortly be tested in a full-scale exercise.
- A recent campus program improved *lighting* across campus.
- Our buildings are in *ADA compliance.* The CSM campus is a mixture of very old and very new buildings. In the mid-1990s, CSM participated in the State of Colorado's ADA Compliance Program. At that time, CSM addressed access issues in the main campus academic buildings that included, but were not limited to, building entrances, elevators, rest rooms, signage, and alarms and ramps. In the last decade, all new buildings are 100 percent accessible and meet all current building code and ADA requirements, and all renovation projects allow at least partial access to buildings, and meet current building code and ADA requirements.
- According to required statistics, our campus is extremely *safe*. See http://www.mines.edu/All_about/safety/html/statistics.html for the latest statistics.
- Public Safety provides *driver training* for CSM community members who transport students; we have a *15-passenger van policy.*
- The campus responded quickly to the *events of September 11, 2001*. Many classes took time to discuss the events; there was a campus-wide memorial service on the Commons; international students were counseled and cared for; the Diversity Committee sponsored a series of forums open to the campus community on topics ranging from a primer on Islam to dealing with students with emotional problems. A memorial service was held on Kafadar Commons on Sept. 11, 2002.
- A *campus climate study* was commissioned and completed in the fall of 2001.

Resource Room
Campus Climate Report
Faculty Handbook

j. "academic resources and equipment (e.g., libraries, electronic services and products, learning resource centers, laboratories and studios, computers) adequate to support the institution's purposes":

CSM has a number of academic resources and equipment to support our purposes:

Library

Resources. The Library is the major means by which students gain access to books, serials, and other materials needed for their education.

- Reserve and course-related readings are indexed via the Library's catalog by course number, instructor, and title, and are accessible during all hours of operation.
- Print reference materials are available during all hours of operation; hundreds of electronic reference titles, most accessible via the campus computer network, are available at all times.
- Professional librarians are available approximately 55-58 hours/week to assist students on site, by phone, or by e-mail.
- A new library system, Endeavor's Voyager, was installed in 2001.
- We maintain a focused collection of materials in support of the curriculum, research and community needs of CSM.

Resource Sharing. The Library places a priority on resource sharing to improve interlibrary loan and document delivery services for the CSM community. This includes:

- As a member of the Colorado Alliance of Research Libraries, we have reciprocal agreements with fellow members, who include major academic, public and private library systems in the state.
- The Library participates in Ariel, a national program of electronic document delivery.
- The Library is a member of Prospector, Colorado's unified library catalog, which allows patrons to place their own interlibrary loan requests and expedites delivery.
- The Library encourages the use of electronic document delivery forms via its website and participating database vendors to remove barriers to placing requests.

Print Collections. The Library continues to develop its collections, with an emphasis on science and engineering. However, serials price increases in science and technology continue to threaten our ability to provide adequate access to scholarly work for all academic programs. In addition, the cost of supporting highly popular electronic materials adversely affects the print collection's budget.

New and Electronic Formats. The Library continues to enhance its print collections with microform and digital formats. (Audiotapes, videotapes, and CDs are peripheral to the institution's needs at this time.) Since the last NCA review, the Library has acquired hundreds of electronic databases (some with full electronic text), serial titles, books, and government documents.

The Library recognizes the wide range of users' needs—many live off campus or are engaged in off-site sabbaticals, field work, internships, and foreign study. (Users have requested information from other states and other countries, in remote exploration areas, on board ocean vessels, etc.) We place a priority on ***off-site access***:

- Library's website, with finding aids, reference help, user guides, and document delivery and materials request forms
- Catalyst, the Library's Web catalog

- Databases that are accessible via the campus computer network (on and off campus)
- Links to public databases, mostly from the Federal and State government
- A large collection of electronic serials and reference materials
- Virtual Personal Network (VPN) software, acquired by the campus Computing Center; this software facilitates access for CSM users to databases and electronic text from anywhere off campus

The Library's electronic resources are very much in demand by the CSM community; we consider them essential to the students' education. Making these resources "an integral part of a student's education" has required a great deal of commitment and effort. The Library's ***support*** has included:

- Written or partnered with campus groups for over $285,000 in grants for technology-related resources
- Investing heavily in staff training to use and teach technological applications
- Maintaining an extensive Website to improve access to information
- Developing resources and programs to integrate electronic resources into the students' education
- Increasing the number of professional positions to support technology in the Library

Support to maintain these resources consistently or to adequately plan for the inevitable software and hardware upgrades continues to be an issue. Support has sometimes been diverted from the print collections or from physical facilities to maintain electronic resources. Because of "packaging" practices by publishers, CSM could lose access to hundreds of journal titles or databases overnight if the Library budget cannot meet a publisher's subscription price. However, the current Campaign has a goal of $7M for library endowments, of which $1M has already been raised. Many of the Library's resource constraints would be alleviated if the Campaign goal is reached.

Electronic Services and Products and Computers

Although we often struggle with funding and priorities, it is incumbent upon us to provide resources and services to our students that will not only support their education, but will serve them well in the future. CSM, like many institutions, funds its academic and information infrastructure from various sources. Institutional funds, technology fees, and a technology endowment form the basis of ongoing support while research, grant, capital construction and other opportunity funding contribute significantly to developing the infrastructure. Three million dollars derived from the sale of Supernet, Inc. were placed in a technology endowment with a goal to grow to that endowment in the capital campaign.

CSM's technology fee structure and processes are also somewhat unusual. Students elected to assess a $35 per semester fee upon themselves in 1996 and increased it to $60 per semester in 2000. The institution matches this fee dollar for dollar, so a total of approximately $750,000 is available to the technology fee process each year. Technology fees (along with institutional matching funds) are awarded through a

competitive proposal process undertaken twice per academic year. The technology fee committee consists of five faculty and five students (3 undergraduate, 2 graduate). The committee is chaired by the Director of Computing and Networking, who can only vote in the event of a tie. These funds have contributed a great deal to improving the technology infrastructure and environment of the institution over the last seven years.

Campus Computing and Networking Resources

Colorado School of Mines strives to provide a robust academic computing and networking infrastructure that provides local resources and facilitates the use of personally owned computers and access to remote resources. Computer teaching labs and workrooms are heavily used, even with exceptionally high rates (greater than 92%) of student computer ownership. The following highlights represent some of the facilities and resources of particular importance to students and the academic program:

- 831 computers are available in 52 computer labs or workrooms on the campus. 484 of these are located in computer labs or work areas in academic departments and are usually restricted to use by students taking classes in those departments.
- Of the total, 347 are located in 10 teaching/open labs or work areas that connect to the Computing Center domain (csmcc). These systems are located in the Green Center, CTLM, Writing Center, and Library and are considered "public" meaning they can be used by any student in any program. Home directory space on campus and department servers is typically accessible from personally owned computers so students can access work done in class directly from their residence hall room or home if they live off campus.
- The Center for Technology and Learning Media (CTLM) is a technology-enhanced learning facility containing computer-based teaching laboratories that support active learning programs and classes such as EPICS, Studio Physics, MEL, and GP311. All spaces have ceiling-mounted projection systems along with instructor computers, document cameras, inputs for auxiliary computers and other devices (VCRs, DVDs, etc.), advanced switching systems, KVM control, and Smartboard electronic whiteboard systems. Six breakout rooms are available for class breakout and project work, group study, and meeting with class project clients. Many network and power outlets are available in study areas throughout the building and every seat in the first three rows of the lecture hall have network and power outlets. All areas inside and immediately surrounding the building are also covered by the wireless network.
- A broad range of academic software applications is maintained at appropriate licensing levels (site, department, volume, individual) to support academic needs. Examples include Mathematica, Matlab, NAG, MS-Office, Grapher, Surfer, and a variety of programming languages and development tools. Student-owned systems are typically not covered by site licenses, with the exception of anti-virus software, which is available free to any community member.
- All residence hall rooms and the Mines Park apartment complex are directly connected to the campus network. Some fraternity houses are also connected to the campus network. Residence Halls typically have two ports per room. Ports in apartments depend on the size of the apartment. Prospector Village is not connected to the campus network at this time.
- Off campus residents can access resources via the campus modem pools at no charge or subscribe to high-speed data services through local providers. Virtual Private Network services are available to students, faculty, and staff who need to access restricted campus resources through third-party providers.
- The campus network infrastructure is based on fiber optic cable between buildings and mostly category 5E twisted-pair cabling delivering service to the wall plate within buildings. Most future installations will be category 6 cabling. Building connections to the campus backbone are at 1Gb and most desktop service is switched 155 Mb Ethernet.

- CSM is a member of the Front Range Gigapop (FRGP), a consortium of institutions and agencies formed to provide high-speed connectivity to the commodity Internet and Internet 2. CSM's commodity Internet connection is currently 20Mb service via an OC-3 dedicated link to the FRGP.
- CSM is connecting to Internet 2 via its OC-3 link in September of this year.
- Wireless network access is available in various locations on campus including the CTLM, Library, Computing Center, and some academic buildings. Additional locations will be added over the next year.
- During the academic year, central student computer labs are open the following hours:
    - Monday through Thursday 7:00am – Midnight
    - Friday 7:00am – 6:00pm
    - Saturday 9:00am – 5:30pm
    - Sunday 9:00am – Midnight
- Students can borrow laptop computers for short-term use (up to 3 days, longer with special permission.) Preparing or delivering class presentations, working on special projects, emergency use when their computer is broken, and athletic, conference, or personal travel are common uses. LCD projectors, digital cameras, wireless network cards, and a few other items are also available for short-term loan.
- Students can develop and publish their own home pages, within the guidelines of the personal home page policy, via the campus network or on campus web servers.

Electronic Services and Products

Some of the electronic services and products in use by, or made available to, students and faculty include the following:

- Electronic mail services (e-mail) through a variety of clients, including webmail.
- The Blackboard course management system is being increasingly used to organize and distribute course and resource material, administer quizzes and tests, host discussion forums, and communicate with and among students. During the 2001-2002 academic year, 111 courses used Blackboard components. For Fall 2002 alone, 76 (some with multiple sections in a single Blackboard "course") are making use of the system.
- The CAPA (Computer Assisted Personalized Approach) system is used extensively as a teaching tool within some courses in the Physics curriculum.
- 260 Smartforce computer-based training courses are available to the campus community in a variety of technical and support areas. Technical offerings include Microsoft operating system and office suite products, Java and C/C++ programming, web editing with Dreamweaver, Unix, network management, and many others. Non-technical offerings include topics such as dealing with conflict, effective project management, managing your time, making decisions, and team leadership. These courses can be taken by any student, faculty, or staff member at any time, be used as an element of an existing class, or used as supplementary material. There is no charge to take these courses.
- A variety of other web-based and other products and services such as anti-virus software, e-mail list management subscriptions and services, web-stored e-mail attachment services, spam management tools, virtual private network (VPN) services, and wireless network registration and access.
- A web-based help desk system is being deployed on October 1 to track service requests and activity for academic department support services.
- Students can register for, and drop and add, classes via the web as well perform functions such as update address information, look up grades, retrieve schedules, view course listings, and pay bills. Faculty enter final grades directly via the web and can view student records as appropriate.

Employees can access accounting information for which they are responsible or authorized via the web along with their personal, payroll, and benefits information.

- An extensive web site with a broad range of information is maintained by the institution in order to provide information to current and prospective students, faculty, staff, alumni, and the public. A high-end professional search engine helps locate resources across several servers. However, departments/divisions often contract externally for web design and maintenance services.
- Firewall services are beginning to be offered to the campus as a component of security planning efforts.

The infrastructure for academic computing and networking has advanced and matured into the philosophy of providing a total technological environment. To the extent that technology facilitates activities in teaching and learning, scholarship, outreach, student services, and administration, there must be concomitant support in local and wide-area networks, information systems and resources, and technical staff. Accordingly, the staff of the Computing Center understands that their primary responsibility is to "support the people, not the technology." To that end, CSM needs additional support staff in order to fully serve the campus community.

Learning Resource Centers

A variety of learning resources exist at CSM:

Tutoring services are available to all CSM students for freshman and sophomore courses. These sessions are held in the Van Dewerker Lounge (between Morgan and Thomas Halls) during regularly scheduled times. The tutoring schedule is posted at http://www.mines.edu/Stu-life/academicservices/tutoring.html .

Academic Excellence Workshops are designed for students who want regular, in-depth assistance to master information in a specific course. Workshops meet one evening a week and are led by undergraduates who work closely with the faculty member coordinating the course. The schedule for Fall 2002 can be found at http://www.mines.edu/Stu-life/academicservices/aew.html .

The LAIS Writing Center is located in Stratton 311. Its mission statement, hours of operation, and other information can be found at http://www.mines.edu/Academic/lais/wc/writingcenter.html .

CSM has not yet been successful in establishing a *language laboratory* or an oral communications laboratory, nor do we currently have the personnel to support them or a space in which to house them. However, we are hopeful that the current Capital Campaign will raise the funds necessary to provide these long-needed facilities.

Laboratories and Studios

Although space allocation is always an issue, we have numerous laboratories available for both undergraduate and graduate students. Several of our instructional labs are housed in newly renovated buildings, e.g., chemistry labs in Coolbaugh Hall, others in the new state-of-the-art Center for Teaching and Learning Media (CTLM), e.g. studio physics and Multidisciplinary Engineering Labs (MEL). Departments/divisions also have

labs for their upper division majors including space such as the dedicated Unit Operations Lab in Chemical Engineering.

Faculty and graduate students also make use of a variety of laboratory spaces requisite for their research. In the fall of 2002, a new, self-funded research facility will come on line consisting of 40,000 square feet in research space available to campus researchers and 20,000 square feet for the Geology Museum. Among the larger laboratory facilities on campus are the Center for Commercial Applications of Combustion in Space (CCACS), the Advanced Steel Processing and Products Research Center (ASPPRC), the Senior Design House, a variety of computing labs, and the Center for the Experimental Study of Subsurface Environmental Processes.

k. "A pattern of financial expenditures that shows the commitment to provide both the environment and the human resources necessary for effective teaching and learning":

Revenue shows a diversified campus economy where state funds, auxiliary and restricted funds contribute approximately equally to a variety of campus functions. Restricted funds include revenue from research—federal, state, local, and private as well as private giving—scholarships, endowed chairs, etc.

CSM's allocation of resources highlights the priority given to instruction, plant operation and maintenance, and financial aid. A look at the FY 1994-95 to FY 2000-01 expenditure categories (found in the Approved Budget 2002-2003 notebook,) indicates a 37% increase in instruction, 13% in plant operations and maintenance, and 9% in scholarships and fellowships. The CSM budget committee, which recommends allocations to the President, annually reviews priorities presented by the three vice presidential areas. A recurring high priority is faculty compensation and additional faculty to support the teaching mission of the School.

Other budget initiatives supported in recent years include mini-grants for curriculum innovation efforts; increases for library acquisitions; additional support for the School's tutoring program and for adding peer mentors to all sections of CSM 101 (Freshman Success Seminar); and funding for new staff to support opening of the new classroom building in Fall 2001.

Resource Room
Approved Budget 2002-2003

l. "management of financial resources to maximize the institution's capability to meet its purposes":

Financial management by the School of Mines follows strict adherence to State of Colorado fiscal and purchasing rules. Auditors chosen by the State Auditor's Office perform annual financial audits. The classified staff at CSM are paid and managed pursuant to a well-established state system. Financial status reports are part of each Board of Trustees meeting agenda. The management of financial aid programs is governed by both federal and state laws and rules. The Colorado Commission on Higher Education requires well-defined and prescribed reporting on student data and on capital

construction projects. Annual review of the School's budget request by the General Assembly provides additional oversight.

Summary of Criterion 2

Conclusion: ***We believe that CSM has effectively organized the human, financial, and physical resources necessary to accomplish its purposes and therefore meets the requirements for Criterion 2.***

Strengths:
CSM has a number of strengths in its human, financial, and physical arenas. In human terms, we have an excellent, well-qualified faculty whose members are generally both outstanding teachers and first-rate researchers. Our administrative and library faculty are also extremely dedicated and well qualified. The classified staff also share a sense of our Connected Learning Community and our customer-focused approach. Financially, we believe that our small size provides us with the agility to respond quickly in times of financial hardship like the present. Our physical plant is attractive and safe and Golden is an appealing venue for prospective and current students. Our buildings and grounds are beautiful and well maintained; there have been a number of improvements to the physical plant over the past decade. The CTLM is a showpiece building and technology is available across campus. The new student center provides "one stop shopping" for students. Our campus is almost entirely ADA accessible.

Weaknesses:
Though we are generally able to accomplish our purposes, we perceive some weaknesses in this area. The only weakness in our people is our lack of "bench strength." We are thin on staff and our small size (in general, we believe, an advantage) means that people often have to take on activities that several people would cover in a larger institution. For example, we don't always have adequate technical support. Our physical plant still has some buildings that have not been remodeled (e.g., Meyer Hall) and we could also use additional space, particularly for graduate student offices and research labs. Some rooms on campus are still inadequately prepared for electronic resources. Some of our software is outdated, particularly on the administrative side (e.g., HRS, SIS, FRS).

Opportunities:
We are taking advantage of a number of opportunities in this area. The new Staff Development Center in Guggenheim Hall will allow us to centralize on-campus training and thus help to provide staff members with the skills they need to perform even better. Renovations and additions to buildings continue, even with the economic downturn. Our new research building will be completed in the fall of 2002 and we have plans for several additional renovations and additions. As we move more and more information onto our web site, we create the opportunity for more "self-service" by people on campus and thus reduce the workload on our staff.

Threats:
The major threats to our ability to accomplish our purposes involve people and finances. We are working hard to keep faculty hires and salaries on a par with peers nationally. However, it is becoming increasingly difficult to keep up. On all fronts (academic faculty, administrative faculty, classified staff) we may be asking people to do too much and thus risking burn out. Much of our financial status over the next few years will depend on State finances as well as the effect of the economy on our current endowments and the success of our current fundraising campaign.

Criterion 3: ***"The institution is accomplishing its educational and other purposes."***

a. "educational programs appropriate to an institution of higher education."

i. courses of study in the academic programs that are clearly defined, coherent, and intellectually rigorous;

Since the early 1990's (shortly after NCA's last general review of Colorado School of Mines), the School has been active in institution-wide reforms to improve its entire undergraduate curriculum. These reforms were driven by our desire to:

- update the attributes describing the graduates of this School, as traditionally documented in the *Profile of the Colorado School of Mines Graduate,* in alignment with the evolving expectations of our constituencies, and in alignment with our evolving mission;
- revise the entire curriculum in accordance with the expectations implied in this updated *Profile* and in accordance with sets of subordinate and department-specific *Program Goals*; and
- execute the above in a mode that leads to an institution-wide system of continuous improvement.

In 1994, as the updated *Profile of the CSM Graduate* was finalized, the Vice-President for Academic Affairs charged six campus-wide committees to analyze different parts of the curriculum in effect at that time. More than one-fourth (50) of the academic faculty were involved in these committees. Their charge was to "analyze course offerings by subject matter, comparing our offerings and requirements to those of the top engineering and applied science programs in the country and to the future needs of society. Appropriate institutions and industries should be defined for the comparison study and hard data should be gathered. Each committee should attempt to answer the question of whether or not we are providing the type and quality of education that graduates from CSM will need in the 21st century."

The six committees worked in the following curricular areas: Mathematics and the Basic Sciences, Humanities and the Social Sciences, Engineering and Applied Sciences, Engineering Design, the Engineering Practices Introductory Course Sequence, and the Degree Program Options. To augment the work of these committees, the School contracted with the American College Testing Service (ACT) to conduct a customized survey of Mines alumni over a period spanning from two to fifteen years since graduation. The survey was sent to 2,800 alumni and the response rate was 30 percent. Narrative and Lickert-scaled responses were gathered in academic areas ranging from broad institutional perceptions to the narrower concerns of each curriculum study committee.

When the committees had completed their analysis of the curriculum and its alignment with the *Graduate Profile*, the Vice-President for Academic Affairs convened an institution-wide committee to steer the reform process, the Curriculum Reform Steering Committee (CRSC). The purpose of the CRSC was " ... to develop a framework for a

curriculum that will produce graduates who fulfill the highest expectations of the CSM *Graduate Profile*."

The CRSC synthesized a more definitive framework that embodied the desirable features of each of several initial models. This work converged on the framework model presented below in Figure 1. This model merely represents the architectural components and connections within the curriculum, and is not intended to indicate the relative apportionment of semester-hours to each curricular segment. The principal features of the framework model are:

- vertical pathways in the humanities and social sciences, engineering practices and design, and the technical sciences;
- horizontal connections in engineering design courses, and in a coupled sequence of "systems" courses, respectively covering Earth and Environmental Systems, Engineered Systems and Human Systems;
- an organized cluster of courses in the mathematical and basic sciences (calculus, physics and chemistry), with appropriate and synchronized linkages between these courses;
- organized clusters of upper division courses in the humanities and social sciences, that together with the lower division requirements in that area, establish a thematic focus in the humanities and social sciences that is pertinent to the mission of the School;
- clusters of science and engineering courses that fulfill prerequisite needs in several, but not all, degree programs, represented in the framework as "distributed core";
- a principally upper division block of science and engineering topics that varies according to the differing goals of each program; and
- a core curriculum required of every Mines student that covers all parts of the framework, except the engineering/science topics block and the distributed core block.

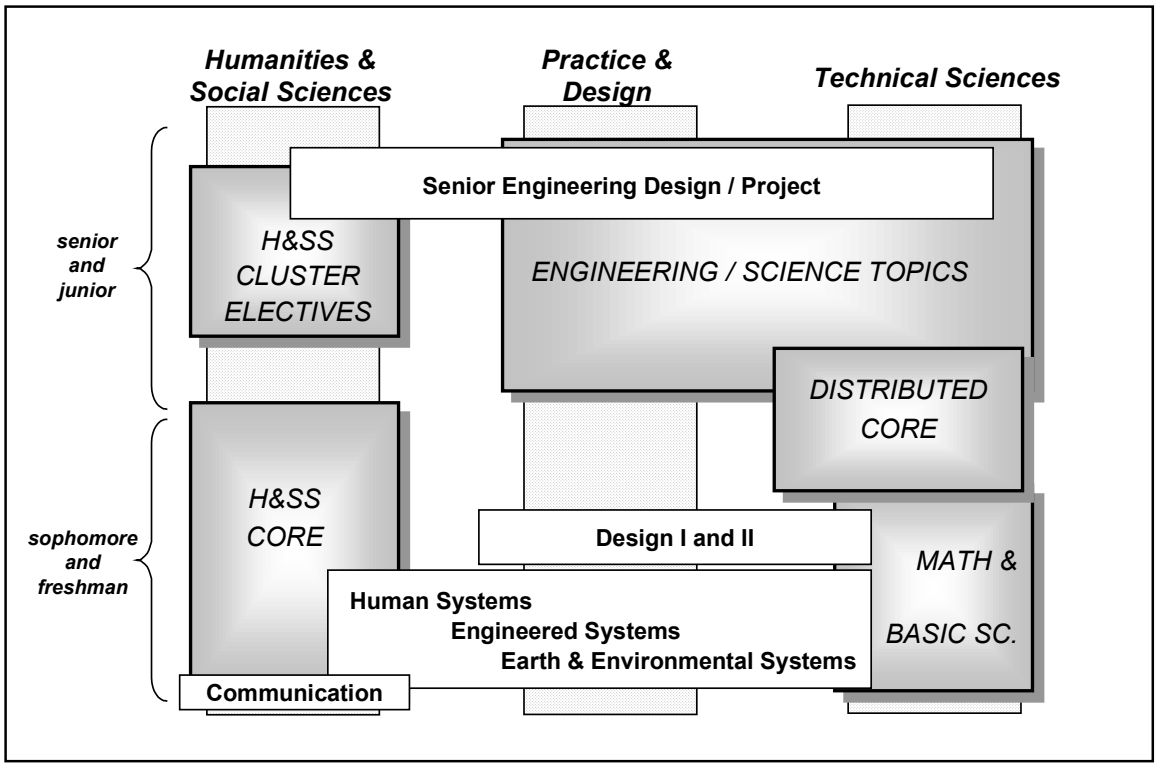

Figure 1: Architectural Layout of New Curriculum

The other major activity of the CRSC during the fall semester of 1996 was the compilation of *"A Report to the Academic Community of the Colorado School of Mines - A Revised Undergraduate Curriculum Framework and Implementation Plan for the Colorado School of Mines."* This report played a pivotal role in engaging the campus community in the details of curriculum reform, in the ideas that it carried, and in the process of moving the project forward.

Therefore, in November 1996, the Undergraduate Council was asked to approve the curriculum framework described in the first part of the document *"A Revised Undergraduate Curriculum Framework and Implementation Plan for the Colorado School of Mines."* After the Undergraduate Council's approval of the framework, we then took it to the Board of Trustees at a special informational meeting held in January 1997. The Board endorsed the progress to date, and encouraged the School to proceed with more detailed developments and pilot implementations.

Individual courses and programs in the new curriculum were taken to the faculty's representative body, the Undergraduate Council, for approval. As a follow-up to these approvals through Undergraduate Council, the Faculty Senate invited faculty comment and then gave its approval, and the Board of Trustees voted on the full curriculum during its meeting on March 26, 1998.

The Undergraduate and Graduate Bulletins outline each academic program clearly and coherently. The web sites of the various departments and divisions provide clear evidence that each is aware of its role in the mission of the institution. They provide detailed information about programs, in general, and course options with syllabi,

descriptive material, and pre-requisites for each. Each program has a Visiting Committee composed of individuals from industry, government, and academia. These committees convene every two to three years for a detailed review of the program; after each visit they prepare a report to which the Board of Trustees responds. In addition, all of our engineering programs are accredited by ABET and the B.S. Chemistry program is accredited by the American Chemical Society.

Resource Room
Undergraduate & Graduate Bulletins
Visiting Committee reports & responses
ABET Documents
"Revised Framework" document
Results of alumni survey
Board of Trustees minutes
Undergraduate Council minutes

ii. *programs that include courses and/or activities whose purpose is to stimulate the examination and understanding of personal, social, and civic values;*

The Colorado School of Mines has always adopted a mission driven approach in configuring and delivering its educational programs. The *Profile of the Colorado School of Mines Graduate* articulates those educational attributes that characterize the engineering and science graduate of the School during the late 90's and early 00's. The *Profile* (found on page 13) expresses the educational attributes desired for every graduate of the School, and has therefore been the driving force for our institution-wide curriculum reform program. The *Profile* recognizes the complexity of education necessary for today's engineers and scientists. Clearly many of the attributes relate to personal, social, and civic values.

In addition, in its accreditation requirements, the Accreditation Board for Engineering and Technology (ABET) stresses several outcomes that all engineering students should demonstrate. These include: "an ability to function on multi-disciplinary teams; an understanding of professional and ethical responsibility; an ability to communicate effectively; the broad education necessary to understand the impact of engineering solutions in a global and societal context; a recognition of the need for, and an ability to engage in life-long learning; and a knowledge of contemporary issues." (See Criterion 3 at http://www.abet.org/images/Criteria/2002-03EACCriteria.pdf .)

Each student at CSM must take a common core of courses, which, in addition to a rigorous selection of courses in math and science, includes an introduction to the humanities and technical writing, Nature and Human Values; Human Systems; Introduction to Economics; and a cluster of three related courses in the humanities and social sciences. In addition, approximately 10% of each year's freshman class is admitted into the McBride Honors Program, a 27-credit program leading to a minor in Public Affairs. Many projects in the required 2-semester EPICS program as well as senior design projects have social and civic dimensions. In addition, Mines students are civic minded and the various clubs and sororities and fraternities on campus participate in public service projects ranging from tutoring to clean up of Clear Creek.

Finally, many senior design projects have a community service or international outreach emphasis. For example, current or recent projects involve the design of a pollution containment structure in St. Kitts, minimization of pollution from snowmobiles, construction of a room in Mexico, and development of energy efficient techniques for home use.

Resource Room
Clusters Brochure
McBride Brochure
Bulletins
Current Academic Plans

iii. *programs that require of the faculty and students (as appropriate to the level of the educational program) the use of scholarship and/or the participation in research as part of the programs*;

Practical experience is a core educational value at CSM. The extensive undergraduate Field Session program reflects this. Many departments offer opportunities for undergraduate students to participate in research and scholarship. Activities range from department to department, from field experience in Utah and Colorado for geology students to open-ended projects in mathematical and computer sciences. The Department of Mathematical and Computer Sciences has an NSF-sponsored Research Experiences for Undergraduates (REU) grant. Several other CSM faculty members also have REU extensions on their research grants. Our NSF Computer Science, Engineering and Mathematics Scholarships (CSEMS) grant contains a student research component. The Chemistry Department offers a senior level research course, CH495 and the Chemical Engineering Department has an honors undergraduate research program. All divisions and departments offer students the opportunity to conduct research or do independent study.

Design courses are another means of participating in scholarship and research. When the curriculum reform was instituted in 1996, a design stem was established to flow from EPICS (Engineering Problems Introductory Course Sequence) in freshmen and sophomore courses into specific courses in the junior and senior years. The EPICS program has achieved national recognition for its innovative way of introducing students to engineering design (http://www.mines.edu/academic/epics) . All departments have a senior design course or senior project that serves as a capstone for students' undergraduate education.

Most graduate degrees require a significant component of scientific research. All Ph.D. programs require no less than 24 research credits. Thesis-based master degrees require 12 research credits. Some non-thesis master and professional degree programs also require completion of a research-related case study or engineering report. Degrees not explicitly requiring research are flexible enough so that they can be tailored for those students wanting research experience.

Faculty members are expected to be research active and to relate their research to both graduate and undergraduate students. Research activity is essential for obtaining tenure

and promotion. CSM researchers recorded the largest funding year ever for fiscal year 2002 with a total of $30,301,850 in 475 awards from federal, state, and private sources.

Resource Room
Web pages for REU's
Information on EPICS

iv. programs that require intellectual interaction between student and faculty and encourage it between student and student;

Most classes at CSM are relatively small. The student faculty ratio is currently 15:1. Even in large core classes such as Chemistry I and Nature and Human Values, large lectures are augmented by small recitation sections and/or laboratories. Mines has also long been dedicated to good teaching and using pedagogies backed by solid educational research. As a result, courses such as EPICS and Studio Physics focus on active and cooperative learning with faculty who serve as "coaches" rather than "lecturers." Classes tend to become smaller as students progress through their majors. There are also many opportunities to work one-on-one with a faculty member or in small groups of students during field sessions; in these situations as well as senior design classes, students have an opportunity to interact with faculty informally.

The Student Development and Academic Services office offers a variety of programs in which students interact with other students through tutoring and Academic Excellence Workshops.

All freshmen are assigned a mentor who meets with them frequently in the Freshman Success Seminar, CSM 101 (http://www.mines.edu/Stu_life/studev/info101.html). The intention of the course is to ensure success for the incoming student. Once a student declares a major, he or she is assigned an advisor in the major department. Many advisors spend a great deal of time with their students; however, in some of the larger departments advisors have many advisees and therefore must devise creative ways of meeting student needs including group advising. An Advising Coordinator is working with departments/divisions to develop more effective advising policies.

The McBride Honors Program in Public Affairs for Engineers fosters student-faculty and student-student interaction through its seminar format. Small groups of students meet weekly with moderators to discuss readings relevant to the seminar topic. Students in the program complete a seminar every semester from their second through eighth. During the junior year, they have the choice between foreign area study and domestic study with a trip to Washington, DC over spring break. The McBride Program's primary purpose is:

> *To provide a select number of engineering students the opportunity to cross the boundaries of their technical expertise and to gain the sensitivity to prove, project, and test the moral and social implications of their future professional judgments and activities not only for the particular organizations with which they will be involved, but also for the nation and, indeed, the world.*

The URL is: http://www.mines.edu/academic/mcb_honors/

Students also interact with each other through many campus organizations ranging from the Anime Club to religious groups. In addition, there are strong student professional

organizations, including one of the largest Society of Women Engineers (SWE) chapters in the country. A complete listing of student organizations can be found at: http://www.mines.edu/stu_life

Resource Room
Brochures from Student Development and Student Life
McBride Brochure

b. "assessment of appropriate student academic achievement in all its programs, documenting":
   i. *Proficiency in skills and competencies essential for all college-educated adults*;

The Colorado School of Mines has been involved in formalized assessment programs since the late 1980's, when the state mandated the development and implementation of an institution-wide assessment program. This School chose to conduct longitudinal assessments of randomly selected and statistically significant samples of incoming students, and to evaluate the progression of their growth in technical competency, critical thinking, written communication, and cultural knowledge, ethics and international awareness. Not surprisingly, the School chose these dimensions of evaluation because of their alignment with the attributes in the *Profile of the Colorado School of Mines Graduate*. Comprehensive Assessment Reports were prepared and filed with the Colorado Commission on Higher Education for the academic years 1990-91, 1991-92, 1992-93 and 1993-94. Although the state rescinded its mandate for assessment in the mid-90's, the School has continued to gather longitudinal assessment data and continues to use this to evaluate and act upon specific sectors of our educational programs. In addition, each program also conducts on-going assessment and evaluation of its student outcomes.

These assessment activities have been institution-wide in scope because of the type of core skills and knowledge sets being evaluated. An institution-wide committee of seven faculty members from across campus was set up to facilitate the process. This original committee, dating back approximately one decade, formed the nucleus of what has since become a standing sub-committee of the Undergraduate Council. Its role is task-oriented and advisory, and it fulfills a special need in coordinating the assessment of the core curriculum. This committee has undertaken the following tasks over the past few years:

- periodic assessment of institution-wide facets of the core curriculum, most recently in the area of written communications;
- cross-coordination of assessment activities among academic units that deliver courses in the core curriculum, and the summative contribution of the core to the engineering program outcomes defined the *Profile of the CSM Graduate*.
- presentation of institution-wide workshops for department heads, division directors and faculty on the subject and methodology of assessment, and on continuous improvement processes; the committee sought to instill the assessment and improvement model presented in simplified form in Figure 2.

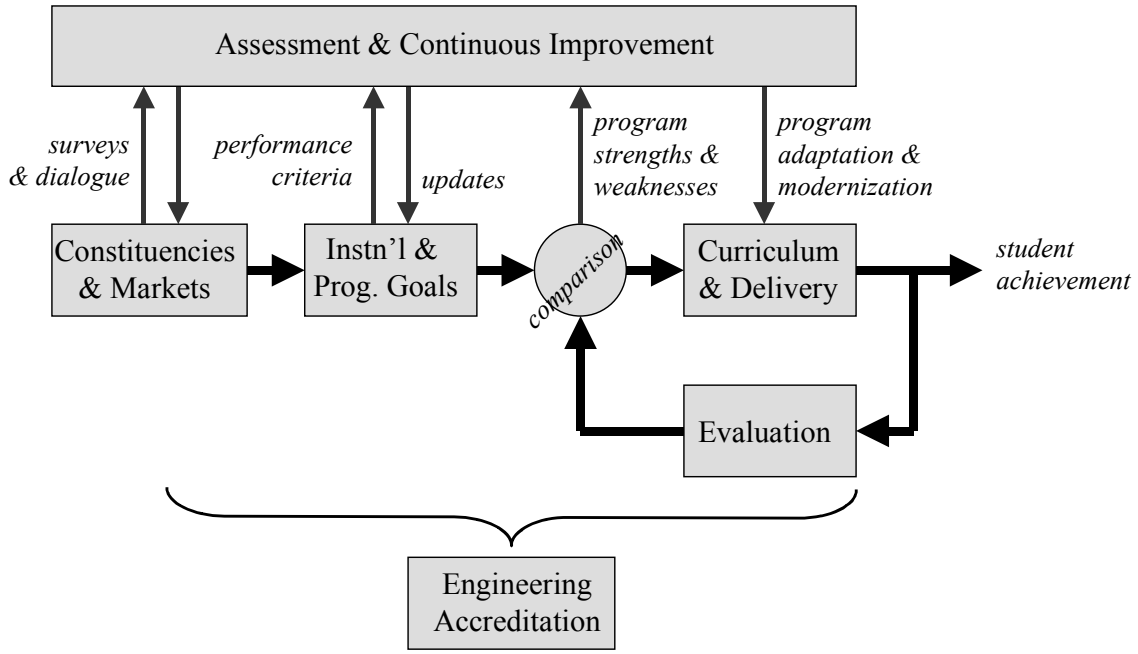

Figure 2. Assessment and Improvement Model

In addition to the work performed by this committee on the Mines campus, several committee members have been active and acknowledged for their expertise in the field of educational program assessment at the national level. Many of these faculty members are active in the Center for Engineering Education. Drs. Ruth Streveler and Barb Moskal have championed this effort to coordinate campus-wide assessment and pedagogical research activities, together with work in cognitive psychology. For example, Drs. Ron Miller and Barbara Olds frequently host assessment workshops at regional and national engineering education conferences, they have published widely in the field, and they have attracted federal sponsorship for a variety of research projects pertinent to the advancement of assessment techniques. Dr. Michael Pavelich has a significant track record in research and practice in the longitudinal measurement of intellectual maturation using the Perry scale, and Drs. Barbara Bath and Moskal have brought many innovations in pedagogy and assessment to the delivery of calculus in a science and engineering context. The web site for much of the campus assessment activity is: http://www.mines.edu/Academic/assess/Resource.htm.

Individual departments/divisions also have considerable assessment activity.

Resource Room

Sample assessment materials

ii. *Completion of an identifiable and coherent undergraduate level general education component.*

Figure 1 illustrates the broad outlines of the CSM curriculum in which all students complete a common core of courses including mathematics, science, and humanities and social sciences requirements. The common core is listed on page 33 of the

Undergraduate Bulletin. The courses in this core were selected according to the process described in Criterion 3,a,i, to 1) provide all Mines students the background necessary to be successful in their upper division classes regardless of the major they chose, and 2) to help meet the goals of the *Profile of the CSM Graduate*. We believe that this general education core, which is easily identifiable, is also coherent and appropriate for our role and mission.

Resource Room
Undergraduate Bulletin

iii. *Mastery of the level of knowledge appropriate to the degree granted*

In addition to the institution-level assessments of student mastery of knowledge (departmental assessment processes, institutional assessment processes), there are a number of external validations of our students' achievement:

- The recent ABET accreditation of all engineering departments. As an example of a departmental self study, the Engineering Division ABET Self Study report can be found at: http://egweb.mines.edu/files/abet.pdf
- Our students continue to be hired in large numbers and at excellent salaries. Recruiters return year after year. Information on placement is available at: http://www.mines.edu/Stu_life/career/2001_Salaries.PDF
- Our students have a very high pass rate on the Fundamentals of Engineering exam, a measure of their basic engineering knowledge. For example, the CSM pass rate from 1998-2000 was 91.9 percent compared to 84.5 percent at the University of Colorado-Boulder, and 62.8 percent at the University of Colorado-Denver. The U.S. average pass rate for accredited institutions during the same period was 80.3.
- CSM graduates are accepted to prestigious graduate schools, not only in engineering but also in law, medicine, etc.
- Alumni tell us that the education they received at Mines has helped them to succeed in their careers (see results of the Alumni Survey from 1996).
- Graduate students must pass qualifying exams, comprehensives, and thesis defenses in order to complete their degrees successful. Mines Ph.D.'s are employed worldwide in a variety of high-level positions.

Resource Room
Alumni Survey
2001-2002 Placement Report
Results of recent FE exams

iv. *control by the institution's faculty of evaluation of student learning and granting of academic credit.*

The Undergraduate and Graduate Councils approve all courses and any changes in curriculum. Each department elects a representative to each Council. The Undergraduate Council is chaired by the Vice President for Academic Affairs; the Graduate Council is chaired by the Dean of Graduate Studies. Both councils are committees of the Faculty Senate. The faculty as a whole approves the graduation lists each semester and is responsible for granting academic credit. The grade appeal process is outlined in the Undergraduate Bulletin (p. 28) and the Graduate Bulletin (p. 22).

c. "graduate programs that":

i. *distinguish clearly from undergraduate offerings*;

Most graduate programs (i.e. Ph.D., thesis-based master and some non-thesis master and professional degree programs) require significant research components as part of the requirements for degrees. For Ph.D. and master degrees, one-third of the required graduation credits must be research based. By contrast, only 3 percent (senior design) of the undergraduate program is required to be research based.

Some graduate programs are interdisciplinary in nature and offer students the opportunity to develop individualized and interdisciplinary graduate research programs at both the master and Ph.D. level. They also serve working professionals through individualized interdisciplinary non-thesis professional master degree programs.

Institutionally, graduate and undergraduate programs are managed by separate administrative units, and overseen by separate faculty councils and committees. The institution publishes and disseminates separate documentation, such as bulletins, student handbooks and web resources, for each perspective student audience.

Graduate courses are clearly distinguished from undergraduate courses through the use of listing numbers in the 500, 600, and 700 range. The institution maintains the scholastic integrity of these offerings by requiring approval of all new course listings by faculty-staffed Graduate and Undergraduate Councils. Faculty members wanting to add new, or modify existing, courses must present course documentation (e.g., title, course level, description, outline and syllabus) to the appropriate Council prior to the course being offered as a regularly numbered CSM course.

Resource Room
Graduate & Undergraduate Council Descriptions
Forms for course approval
Graduate Bulletin

ii. *expect students and faculty to value and engage in research;*

As described earlier (Criterion 3, Section a, iii), most graduate programs have significant research requirements for graduation. The institution and the faculty support this research activity in a variety of ways. For example, through the efforts of individual faculty members, the School has established numerous centers dedicated to research within specific topic areas. Information regarding research centers can be found at: www.mines.edu/research/ord/centers_institutes.html. Departmental research information can be found at www.mines.edu/research/.

Through efforts such as the Centers, research volume has increased dramatically in recent years. In 1990, research awards totaled $11.8 million compared with $30.3 million in fiscal year 2002. The School's mission and strong ties to industry result in a high percentage of research funding from private industry—approximately 40% of all research funding at CSM comes from private sector companies. Last year approximately 246

graduate students (43 percent of students pursuing thesis-based master and Ph.D. degrees) were financially supported through research grants.

iii. *restrict graduate academic credit for prior learning to credit validated by examination; credit based on documented faculty evaluation of a portfolio or original work products, or credit awarded by an institution of higher education either affiliated with a recognized U.S. accrediting association or approved by an appropriate national ministry of education;*

The Graduate Bulletin states: "Credits earned with grades of B or higher may be accepted towards a Professional, M.S., or Ph.D. degree by transfer from another recognized institution if approved by the student's committee and the Graduate Dean. Courses transferred from another university shall not be used to calculate the student's grade point average." Also: "Nine hours of transfer credit are allowed for thesis programs: 15 hours for non-thesis M.S. programs." All credit is approved by the home department and is reviewed by the Graduate School and awarded only when fully justified.

Resource Room
Graduate Bulletin

iv. *are approved, taught, and evaluated by a graduate faculty that possesses appropriate credentials and experience; and*

All tenured and tenure-track faculty are hired only after the institution has conducted an exhaustive national search. Prospective faculty are evaluated, and tenure-track faculty are promoted, on the basis of their research, scholarship, and teaching performance. All graduate students are advised by full-time faculty drawn from this pool. The few adjunct faculty active at the graduate level are, like all adjuncts at CSM, carefully interviewed and must provide transcripts of their course work and degrees. Adjunct faculty members may be appointed as faculty advisors only if they serve as co-advisors with regular tenured or tenure-track faculty members.

In addition, each department head/division director evaluates faculty members annually. Evaluations are based on faculty scholarship, teaching, and service. Faculty are rewarded based on their demonstrated abilities in each of these categories.

Research and teaching activities directed by CSM faculty are highly competitive with those conducted at other institutions. CSM research awards are derived from a diverse stream of sources including private and governmental. Over 60 percent ($18 million per year) of CSM's research volume is generated from governmental sources that are awarded competitively.

Resource Room
Minutes of Graduate Council for past 3 yrs
Graduate Bulletin
List of Faculty

v. *use results of regular internal and external peer review processes to ensure quality*

All divisions and departments have external visiting committees, which serve at the pleasure of the Board of Trustees and are appointed by the President, that review both

their undergraduate and graduate programs. Members of these committees represent academic peer institutions, alumni, employers, and corporate sponsors. Visiting Committees typically review campus programs every two to three years and report their findings directly to the Board of Trustees.

Within the institution, the Graduate and Research Councils are charged with reviewing and approving requests for individual courses, reviewing and making recommendations regarding application for new graduate programs, and reviewing and making recommendations on requests for new research centers. Membership on both Councils is composed of faculty from across the campus. In addition, many individual departments conduct annual student and employer surveys and exit surveys are collected by the Graduate School for every graduating graduate student.

Resource Room
Visiting Committee Reports
Graduate School Exit Surveys
Graduate & Research Council minutes

d. "faculty have and exercise responsibility for determining the institution's award of academic credit."

According to case law, "it belongs to the faculty, by whom the instruction is imparted, to say whether a student possesses the proper qualifications to entitle him to a diploma." (Steinhauer v. Arkins, 18 Colo. App. 49, 69, P. 1075 (1902). Undergraduate and Graduate Councils determine whether courses can be offered, at what level, and for how much credit. For transfer credit, a transparent, model, transfer agreement is in place with Red Rocks Community College and there are plans for extending this agreement to at least one additional nearby community college. Departments have transfer advisors who work with students who wish to transfer, IB, Advanced Placement, etc. credit. The faculty as a whole approves the graduation lists every semester.

Resource Room
Transfer credit form
Red Rocks transfer agreement

e. "effective teaching that characterizes its courses and academic programs (see also Criterion 1, g)"

One of the six Areas of Preeminence for CSM is engineering education, a field in which the School has a long and distinguished history. Effective teaching has always been valued at CSM, which was primarily a teaching institution until the early 1980's. Effective teaching is measured in a variety of ways. Students evaluate every course and the results are made public. In addition, teaching, scholarship, and service are evaluated annually through the Faculty Data Report and department head/division director evaluations. Based on these evaluations, which are reviewed and approved by the administration, annual merit raises are determined.

The promotion and tenure process weighs teaching, scholarship, and service; according to the *Faculty Handbook*, tenure requires "documented success in teaching, scholarship, and service" and promotion to full professor requires "excellence" in all three areas (section 4.2)

The Center for Engineering Education offers a course in the Fundamentals of College Teaching each fall. This two-credit graduate course is designed for advanced doctoral students interested in a career in academia. Faculty (both new and experienced) may also audit the course. A 3-day training for Teaching Assistants is also offered each fall before the start of the semester. Although we encourage graduate students to explore careers in academia, we do not employ them as primary instructors in our classes except on a very limited basis (see the policy approved by the VPAA). If graduate students teach, they are closely mentored by a faculty member in a section of a common course or a laboratory. Adjunct faculty are carefully mentored in their assignments by tenured faculty and/or department heads/division directors.

There have been a number of teaching awards made to faculty by national organizations such as the American Society for Engineering Education, Mathematical Association of America, American Physical Society, and American Chemical Society. Internally, the school recognizes outstanding teaching faculty and faculty who demonstrate both research and teaching excellence with annual awards presented at the April Faculty Forum.

CSM has a national reputation for excellence in educational research with a number of FIPSE and NSF grants in this arena. A recent compilation of research funds showed that between 1992 and 2000 $7.8 million of CSM research funding was targeted at education/learning research. The 2001-2002 report from the Center for Engineering Education describes more recent funding in this area and can be found in the Resource Room.

Resource Room
SYGN600 syllabus
List of education grants
Student evaluations for past 3 years
CEE Annual Report for 2001
Policy on graduate student teaching

f. "ongoing support for professional development for faculty, staff, and administrators"

There are a number of ways that faculty, staff, and administrators are supported. The Center for Engineering education (http://www.mines.edu/research/cee/) assists faculty in improving their teaching, provides seminars on pertinent topics and assists faculty in submitting proposals for educational endeavors. In addition, the CEE provides a campus-wide focal point for faculty interested in educational research and improved pedagogy. The WISEM (Women in Science, Engineering, and Mathematics) program also offers pertinent seminars each semester.

With the curriculum reform, a program was instituted to provide summer funding in the form of mini-grants for the purpose of improving the undergraduate experience. See, for example, http://www.mines.edu/Academic/affairs/circuit/minis98.html . Although we were unable for financial reasons to offer the mini-grant program in 2001 and 2002, our hope is to resurrect it in the near future.

Faculty can apply for sabbaticals every seven years. They must submit a plan to be approved by the Office of Academic Affairs and the Board of Trustees. They must write a report about their activities at the conclusion of their sabbatical. Faculty are also encouraged to submit papers to conferences and generally are supported financially in this respect. Most faculty belong to multiple professional organizations and are active in them. They also receive professional development through consortia and collaborative research groups.

The School has recently established a Staff Development Center (1st floor of Guggenheim Hall) and program of training classes primarily for staff and administrators. The facility includes state-of-the art computing and projection equipment. The classes offered provide training in computing applications (Word, Excel, Office, Access, Front Page, etc.); training in administrative computing systems (FRS, HRS, SIS, related web-based self-service applications), as well as classes related to the many administrative processes the School uses to manage its activities (purchasing, travel, human resources, environmental health and safety, research services, telecommunications, and more. The Community College State Employee Tuition Grant Program provides half of the tuition for state employees at local community colleges. CSM employees may register for up to three credits of classes each semester.

g. "student services that effectively support the institution's purposes"

Most of the student services at CSM are discussed in Criterion 2g. In addition, the Physical Activity program provides wellness and athletic opportunities for students ranging from yoga to varsity football. Physical wellness is considered by the CSM community as integral to the overall mission and reputation of the school. Approximately 85% of the student body participates in varsity, intramural, outdoor recreation and club sports. Plans are proceeding to construct a new Wellness Center and significantly renovate our athletic facilities, which date to 1922 (Brooks Field), 1937 (Steinhauer Field House), and 1958 (Volk Gymnasium).

h. "staff and faculty service that contributes to the institution's effectiveness"

Service to the School, the community, and the profession is expected of all CSM faculty. The Colorado School of Mines believes it is important to be a member of the local community, so staff members serve on a number of community organizations such as the Golden Chamber of Commerce. Several Mines faculty members have served as mayor and/or city council members in Golden.

In the professional arena, the President of Mines serves on the National Advisory Council of the National Renewable Energy Laboratory and on the Advisory Board for Red Rocks Community College. Faculty members serve on visiting committees for other higher education institutions. Administrators and staff members serve on committees for the Colorado Commission on Higher Education. Many faculty serve on committees for their professional societies and they are advisors for campus chapters of those societies. They also frequently serve as reviewers for government funding agencies such as NSF, NEH, FIPSE, NIH, NASA, and the Department of Energy.

On campus, faculty and staff serve as mentors for the freshmen students at CSM. Faculty also serve on both Senate and University committees in addition to departmental and ad hoc institutional committees.

Resource Room
List of campus-wide committees & Members

i. "if appropriate:

i. *evidence of support for the stated commitment to basic and applied research through provision of sufficient human, financial, and physical resources to produce effective research"*

Faculty are supported with start-up and matching funds on grants, although Mines struggles to provide these funds at an adequate level. Award volume has steadily increased from $11.8 million in 1990 to over $30 million this year. Additionally, research funding is diversified between public and private sources, approximately 40% from private, 60% from federal agencies, state and local governments. In order to provide additional physical facilities, the School is constructing a research building. Even with that addition of approximately 40,000 square feet for research laboratories, adequate space for research laboratories remains a concern. We hired a consultant (Joe Bilotta) in 2001 to conduct a space audit of the campus; the results of that study will be available this fall and will help, along with the Facilities Master Plan under development, to drive future decisions about space allocation. The Office of Research Services assists faculty in applying for research grants. Library resources, though not at the level we would hope for some research initiatives, provide help to faculty members conducting research. Each department has a member on the Library Committee and the Research Council who help make decisions about what journals are purchased.

ii. evidence of support for the stated commitment to the fine and creative arts through provision of sufficient human, financial, and physical resources to produce creative endeavors and activities;

Mines does not have many for-credit courses focusing on the fine and creative arts and many of the activities listed below are bootstrapped by students and faculty who volunteer their time with few resources. However, as a result of student requests, the School has made arrangements with Red Rocks Community College for students to take art courses at their institution. CSM has an active music program with a chorus, madrigal group, band, and marching band. The student newspaper, *The Oredigger*, and the student literary magazine, *High Grade*, provide a creative outlet for students interested in journalism, art, poetry, fiction, and essay writing. Students interested in theater participate in Mines Little Theatre, which produces two plays each year. There are several clubs with an emphasis on fine and creative arts. CSM has a very active international student group that educates the general student population with an annual International Day focusing on the arts, culture, and cuisine of their home countries. The Artist-scholar series sometimes includes activities in the fine and creative arts (e.g. piano recitals) as does the Hennebach lecture series. The Jefferson Symphony performs in Bunker Auditorium and the Foothills Art Center is a half block from campus.

Resource Room
MLT programs
Artist-Scholar Programs

Hennebach lecture series flyer
High Grade
Oredigger

iii. evidence of effective delivery of educational and other services to its community;

There are a number of services that connect CSM and the community. Among these are the Geology Museum which will soon be moving to space in the new Research Building where it will be better able to reach its broad audience of K-12 students and faculty. A number of outreach programs are offered through SPACE (Special Programs and Continuing Education (http://www.mines.edu/outreach/cont_ed/), including academic programs, short courses and specialized training for K-12 teachers and professional engineers. The SPACE website provides detailed information about these offerings such as Middle School Robotics Workshops, Denver Earth Science Project, National Science Academy, and Mine Safety and Health Programs.

In addition, through events such as the Young Symposia, the Society of Women Engineers' dinner with industry, and the Career Center's Career Day, CSM connects with the broader community. Several campus organizations including sororities and fraternities perform community service such as tutoring elementary and middle school students. The Minority Engineering Program goes into the inner city schools to help students with mathematics and science and also to provide role models for these students. Mines organizations collaborate with the nearby National Renewable Energy Laboratories (NREL) on such activities as the Colorado Science Bowl and WISEM-sponsored events for girls such as Expanding Your Horizons. (http://www.mines.edu/outreach/cont_ed/eyh/eyh-1.htm). Dr. Laura Kosbar, a chemistry professor on loan from IBM, has developed a highly effective science program in collaboration with the Denver Public Schools.

Mines also delivers on-campus programs for middle school and high school minority students and young women. These programs are usually featured in the summer and provide academic and social opportunities for student groups. Examples include PREP (Preparation for Engineering Program) for middle school students and SUMMET (Summer Minority Engineering Training Program) http://www.mines.edu/Stu_life/mep/k12/SUMMET/SUMMET2002/S2002Application.pdf . SUMMET has been in existence for over 25 years and has helped numerous young people develop the skills and study habits, as well as the enthusiasm, to attend college.

Resource Room
Material from SPACE
Material from Geology Museum
MEP info on SUMMET

iv. evidence of development and offering of effective courses and programs to meet the needs of its sponsoring organization and other special constituencies

The sponsoring organization for CSM is the State of Colorado. CSM was recently named an Exemplary Institution by the state legislature, the only institution in the state to earn

this designation. Our special constituencies include the industries that we have traditionally served as well as those who have more recently begun to hire our graduates. We receive input from these through our visiting committees, through the recruitment and placement process, and through our alumni. Our curricula were validated recently when, through a competitive process, CSM was chosen to assist in the establishment of the Petroleum Institute in Abu Dhabi. Last year all of CSM's engineering programs were accredited by ABET, evidence that we are meeting the needs of that constituency.

Resource Room
Exemplary Institution agreement
ABET report
Petroleum Institute documents

Summary of Criterion 3

Conclusion: We believe that CSM is accomplishing its educational and other purposes and therefore meets the requirements for Criterion 3.

Strengths:
There are many areas of strength under this criterion, only a few of which will be mentioned here:

- We have a very high pass rates on the Fundamentals of Engineering (FE) exam.
- Our placement rates remain high, as do our graduates' starting salaries, despite the recent economic downturn.
- Although we are working to raise them, our six-year graduation rates are above the national average for engineering schools.
- ABET recently accredited all of our engineering programs for six years.
- Our student professional societies, such as SWE, ASEE, SME, NSBE, are active and highly ranked in the U.S.
- The Carnegie Foundation for the Advancement of Teaching visited CSM in January 2002 as a prelude to writing a chapter on CSM in a monograph intended to describe current national practice in engineering education.

Weaknesses:
We continue to require too many adjuncts in several programs; the hope is to replace a majority of them with permanent hires, a process that is already underway. Our resources for arts and cultural enrichment are not adequate. Although we are able to offer a number of programs in these areas, many of them rely on volunteer efforts on the part of faculty and students, e.g. Mines Little Theater. We do not currently have enough resources to adequately develop our graduate program.

Opportunities:
We see a number of opportunities in this area. We continue to evaluate the effectiveness of our curriculum reform and, although it needs tweaking, we believe that we have an excellent core curriculum in place. We are also moving ahead on a variety of new programs such as our M.S. in Engineering and Technology Management that show great promise. Our Center for Engineering Education is a great opportunity (perhaps already a strength) that will allow us to capitalize on our traditional strength in teaching and learning. We have selected six Areas of Preeminence on which to focus our research efforts over the next several years. Finally, our Exemplary Institution status provides us with numerous opportunities for improving our human, financial, and physical resources.

Threats:
Potential threats include a national trend of declining numbers of engineering students and a changing student body nationally which brings with it more instability, mental illness, drug problems and similar problems

Criterion 4: "*The Institution can continue to accomplish its purposes and strengthen its educational effectiveness.*"
In determining appropriate patterns of evidence for the criterion, the Commission considers evidence such as:

a. "a current resource base--financial, physical, and human--that positions the institution for the future"

Financial Resource Base

CSM's financial resource base has suffered during the 2002 and 2003 fiscal years, but we remain cautiously optimistic about the future. The School's resource base has become diversified during the 1990's so that disappointing results in one area may be off-set by other sources. For example, as State funding has continued to decrease in FY 2003, there is hope that research funding will continue to grow. The agreement to partner with ADNOC in developing the Petroleum Institute in Abu Dhabi is another example of a new funding source for CSM.

The School's funding comes in roughly fourths from philanthropy, tuition, research funding, and state revenue.

1. The Office of Institutional Advancement is completing the "quiet phase" of a $125 million dollar capital campaign with the public announcement scheduled for February 2003. Despite the current economic downturn, we are optimistic that we will be able to meet the Campaign goal with over $42 million in hand to date. The current endowment for CSM is $109.4 million, a significant increase over the endowment of ten years ago, but, because of market fluctuations, below the figure of approximately $120 million one year ago.
2. Tuition rates for resident students were raised this year from $2470 per semester to $2623 per semester. Non-resident rates rose from $8035 per semester to $8758 per semester, an increase of nine percent. However, due to the large percentage of resident students who registered in Fall 2002, tuition revenues were approximately $500,000 (about 4% of our budget) below projections for the semester. The Exemplary Institution agreement allows CSM to raise tuition at twice the Denver-Boulder CPI rate starting in academic year 2003-2004. Other state institutions' tuition is capped under provisions of the State's TABOR amendment, which limits state revenues from most sources, including tuition. While the Exemplary Institution agreement will help alleviate financial problems, CSM believes that it is still under priced for the quality education that it offers.
3. Research funding is a bright note in the financial picture. Last year, CSM researchers were granted over $30.3 million in funded research, the largest funding year ever. More than 250 of the 475 awards, totaling $11.6 million, came from the private sector. NASA was the largest federal fund source with $4.9 million, followed closely by NSF with $4.1 million in funding. With the hiring of research-active faculty and the construction of the new Research Building (scheduled for completion in Fall 2002), we are hopeful that this trend will continue.
4. State funding for CSM is primarily based on full-time equivalent enrollment of Colorado resident students. CSM receives approximately $8600 per student full-

time equivalent. Additionally state funding is sometimes available for categorical programs such as technology improvement. Also, the State provides funding for "programs of excellence," a State program designed to recognize high quality academic programs. Although funding has recently been reduced, CSM has greatly benefited from this grant program in the past and currently has two Programs of Excellence grants—in the Engineering Division and the Physics Department. For the 2003 fiscal year, State funds to CSM were approximately $19,462,000, down from approximately $20,045,000 in FY 2002 as a result of a downturn in the State economy. The State economic picture has not improved and there are concerns that a rescission may occur at some point during the fiscal year.

Physical Resource Base

The physical plant of the School is in generally excellent shape with attractive and modernized buildings and grounds. In the past 10 years we have received funding for the renovation of several buildings on campus, including Coolbaugh Hall and Hill Hall, as well as the construction of the Center for Teaching and Learning Media (CTLM). Our Master Plan is in the final stages of development and will be presented to the Colorado Commission on Higher Education by the summer of 2003. We have upgraded many of the dormitories, built a new Student Center and an addition to it, have completely renovated the student housing area in Mines Park, and are nearly finished with the construction of a new Research Building. Many laboratories have been built and/or enhanced through both internal and external funding. One project is currently under consideration for State capital construction funds—renovation of the Green Center (including asbestos abatement).

However, space is always an issue and some departments/divisions are pinched to provide adequate space for faculty and graduate student offices, teaching laboratories, and research laboratories.

Human Resource Base

Our human resource base is stronger than ever with a first class faculty and staff. We continue to struggle to make faculty salaries and startup costs competitive with peer institutions, but we continue to hire outstanding faculty, several of whom have received NSF CAREER awards. Our academic faculty are responsible for our excellent reputation in engineering education and for our record research volume in 2002. There are concerns that some departments/divisions have too few faculty to continue to operate programs well. There is also concern that there are too few technical support staff (particularly computer support staff). A complete list of faculty can be found in the resource room. Administrative faculty and classified staff, nearly all hired through competitive searches, are also first rate and work in collaboration with the academic faculty to achieve our Connected Learning Community.

Resource Room
Capital Campaign documents
Budget for FY 2002, 2003
Master Plan documents
CTLM Brochure
Capital Construction request
Faculty List

b. "decision-making processes with tested capability of responding effectively to anticipated and unanticipated challenges to the institution"

The faculty, staff, and administration work together to make the institution function smoothly. There are faculty and staff committees involved in several layers of decision making. Functions of the various administrative units are described in Section 2b. These, along with the Department Heads/Division Directors, Senate, and Undergraduate, Graduate, and Research Councils are able to deal effectively with anticipated challenges to the institution. In addition, the annual Board of Trustees retreat allows all of these institutional groups to come together to discuss and plan responses to both anticipated and unanticipated issues. The Strategic Planning Task Force is developing a blueprint for the institution and the Curriculum Committee is responding to curricular challenges.

Because we are a small community, but one with broad and fiercely loyal constituencies, we are able to rally in times of unanticipated challenge. The President is also able to appoint ad hoc committees to respond to issues. Such committees have been empanelled to make recommendations regarding diversity, athletics, and strategic planning.

c. "structured assessment processes that are continuous, that involve a variety of institutional constituencies, and that provide meaningful and useful information to the planning processes as well as to students, faculty, and administration."

As discussed in Section 3b, CSM has a variety of structured, ongoing assessment processes involving a variety of constituencies. The School has been heavily focused on continuous improvement based on data since the late 1980's. Because we are a small campus, it is relatively easy for us to share information on which to base evaluation processes. Among the constituencies that contribute to the assessment effort are:

- *The School-wide Assessment Committee*—This group, composed of faculty members from across campus, is currently chaired by Dr. Ron Miller of the Chemical Engineering Department. This group, advisory to the Undergraduate Council, has been in existence since 1988. It developed a portfolio plan for collection of information about the academic progress of first and second year students. It prepared annual reports to the Colorado Commission on Higher Education when these were required by the State. It was also extremely active in educating the campus about the processes and value of assessment and evaluation, conducting a number of workshops for department heads/division directors and faculty in the late 1990's. Several members of the committee are active in national and international assessment activities. See, for example, http://www.mines.edu/Academic/assess/Resource.htm and http://www.mines.edu/fs_home/rlmiller/assess.htm
- The *academic divisions/departments*--each has its own assessment process in place and makes improvements to its programs based on data gathered through the process. Departments/divisions use a variety of assessment methods ranging from portfolios to exit interviews with graduating seniors. All engineering programs have assessment processes in place which were recently validated by the Accreditation Board for Engineering and Technology. These assessment processes, in combination with the

work of the Assessment Committee, ensure that CSM measures student outcomes over our students' entire academic careers.

- *The ad hoc Curriculum Committee*—the charge to this committee, a successor to the Curriculum Reform Steering Committee (1994-2000) is to serve as a "think tank" for curriculum issues, examine the curriculum carefully and make recommendations, and interact with other groups on campus dealing with curriculum issues. For example, at the 2002 Fall Faculty Convocation, the Curriculum Committee conducted an exercise to gather feedback from the entire CSM faculty about revising the curriculum. Based on this feedback, the Committee is planning its activities for the year.
- The *Visiting Committees* for each department/division—these committees make "audit" visits to campus every two to three years and provide valuable external insights into curriculum, management, staffing, etc.
- The *Office of Institutional Research*—provides data on a wide range of fiscal, personnel, salary, and other issues. This office was instrumental in providing data to the Colorado Commission on Higher Education for its Quality Indicator System and will continue to support the reporting requirements established in the Exemplary Institution performance agreement.
- The *Diversity Committee*—tracks diversity issues on campus and provides a comprehensive annual report to the community.
- The *WISEM office*-- provides a similar function related to women's issues.
- The *Admissions Office*—keeps track of admissions trends and data and reports these monthly to the campus community.
- The *Career Center*—develops and distributes an annual report on hiring, placement, and salaries of CSM graduates. This group also conducts surveys of graduating seniors and of recruiters.
- The *Center for Engineering Education* and its faculty affiliates—conduct research on the effectiveness of pedagogical practices and develop new assessment measures.
- The *Registrar*—produces a Registrar's Report every semester and also provides demographic information on student groups for research and assessment purposes.
- The *Office of Budget and Planning*—keeps track of salaries, budgets for various campus entities, etc.
- The *Alumni Association*—keeps track of CSM alumni and polls them about relevant issues.

Resource Room
Sample assessments
Diversity Report
WISEM Report
Curriculum Committee notes
Visiting Committee Reports
Admissions Report
CEE Annual Report
Registrar Reports for 2001, 2002

d. "plans as well as ongoing, effective planning processes necessary to the institution's continuance"

The President has appointed a Strategic Planning Task force to build on his framework in developing a strategic plan for the institution. It is composed of members from all constituencies of the faculty and staff. An RFP has been prepared to hire a consultant for the Task Force to help ensure that the ensuing plan is sound and useful for the institution's continuance. Another ongoing planning effort is the annual submission of an Academic Plan by each department/division. In addition to its monthly meetings, each year the Board of Trustees holds a 2½ day retreat to discuss issues pertinent to the institution's future. This past year the state designated Colorado School of Mines as an exemplary institution. This designation has broad implications for independence in such as areas as developing new degree programs. Previously all such decisions had to be approved by the Colorado Commission of Higher Education. A facilities Master Plan is under development and will be in place by the summer of 2003.

Resource Room
President's Framework
Strategic Planning Task Force notes
Academic Plans from 2001, 2002
BOT Retreat agendas
Exemplary Institution agreement

e. "resources organized and allocated to support its plans for strengthening both the institution and its programs."

CSM has a Budget Committee chaired by the VP for Finance and Operations and comprised of academic department heads, academic and administrative faculty members, and the School's vice presidents. The committee meets regularly during the fall and spring semesters, culminating in its recommendation to the President of a proposed budget for the School for the upcoming fiscal year. Traditionally, each of the vice presidents presents budget initiatives to the committee for consideration. In the recent past the committee has given priority to initiatives which strengthen the School's ability to remain competitive in faculty compensation and to enhance the student experience at Mines. The President presents the budget proposal to the Board of Trustees for action.

Resource Room
Minutes of Budget Committee 2000-2002
Budgets from 2000-2002

Summary of Criterion 4

Conclusion: We believe that CSM can continue to accomplish its purposes and strengthen its educational effectiveness and therefore meets the requirements for Criterion 4.

Strengths:
Among the strengths of the institution in this area are our Exemplary Institution status, our capital campaign, our physical plant, and our strong research showing. We also have a long tradition of assessment and continuous improvement and curriculum reform is an ongoing and grassroots effort at CSM. We have a dedicated faculty and staff, external constituencies, and visiting committees. Our alumni

base, though small by some standards, is extremely supportive, especially those alumni who graduated before 1980.

Weaknesses:
CSM's major weakness in this area is that our aspirations and our funding do not always mesh

Threats:
The biggest threats are in the financial arena, specifically recent trends in State funding for higher education, both for operating and capital budgets. There is also concern about the possibility of lagging fundraising due to stock market declines.

Criterion 5: ***"The institution demonstrates integrity in its practices and relationships."***

a. "student, faculty, and staff handbooks that describe various institutional relationships with those constituencies, including appropriate grievance procedures":

CSM has appropriate handbooks and policy manuals that describe institutional relationships and include appropriate grievance procedures:

- Both academic and administrative faculty are covered by the *Faculty Handbook* which is revised on an annual basis. The function, membership, method of operation, method of appointment, and terms of appointment of the *Faculty Handbook Committee* are found in section 12.4 of the *Handbook*. The Exempt Employee Grievance Procedure is outline in Section 6.6, and the Tenure and Promotion Decision Appeal Procedure can be found in Section 8.3. The entire *Handbook* can be found on line at http://www.mines.edu/Academic/affairs/fachandbook/. Many procedures not covered as policy in the *Faculty Handbook* can be found in the *Academic Affairs Procedures Manual,* which is currently being updated and will be online by midyear.

- Student handbooks are distributed to undergraduate and graduate students at CSM each year. They include information on campus services and facilities, student activities, policies and procedures, appeal processes, degree requirements, and registration. The *Brunton* is the student handbook which is distributed to all new undergraduate students at CSM. The *Brunton* includes appeal processes that students may request in regards to actions related to various situations and disciplinary actions. The *Graduate Student Handbook* is distributed to all graduate students each fall. Policies and procedures for grievances and appeals are also outlined in the *Undergraduate Bulletin* (p. 10, pp. 163 and following) and the *Graduate Bulletin* (p. 21 and following).

- Guidelines for employment and grievance policies for classified staff are promulgated by the State of Colorado. The state *Classified Employee Handbook* can be found on-line at http://www.state.co.us/dhr/pubs/docs/03handbook.pdf.

The Library supports the dissemination of institutional practices and relationships by making available to all:

- Institutional undergraduate and graduate catalogs
- Minutes for institutional governing bodies, including institutional councils and the faculty senate

Resource Room
Faculty Handbook
Brunton
Graduate Student Handbook
State Classified Employee Handbook

b. "policies and practices for the resolution of internal disputes within the institution's constituency":

The policies and practices for the resolution of internal disputes within the institution are covered in the *Faculty Handbook*, the Graduate and Undergraduate Bulletins, the *Brunton*, the *Graduate Student Handbook*, and the *State Classified Employee Handbook*.

c. "policies and practices consistent with its mission related to equity of treatment, non-discrimination, affirmative action and other means of enhancing access to education and the building of a diverse educational community."

Mines students and faculty are working proactively to ensure ethical and equitable treatment of all members of its Connected Learning Community. Students in the ASCSM are developing a student honor code which will be brought to a vote of the student body in the near future. In addition, we are committed to developing an ethics-across-the-curriculum program similar to our highly successful writing-across-the-curriculum program. The freshman-level Nature and Human Values Course focuses on ethical issues. Two speakers in the fall of 2002 have presented their views on ethics—Roger Boisjoly (an engineer who tried to stop the launch of *Challenger*) and Arun Gandhi, grandson of the Indian leader.

CSM has a number of policies and practices in place related to equity issues:

- The Board of Trustees' *Unlawful Discrimination Policy* and Complaint Procedure can be found in Section 10.6 of the *Faculty Handbook*. The *Classified Employee Handbook* states that the State Department of Personnel & Administration strives "to develop and maintain a workforce that is diverse. The state is an employer committed to equal opportunity and committed to hiring the best and the brightest, and to treating all its employees well." (p. 2)
- The *Sexual Harassment Policy* and Complaint Procedure is found in Section 10.7 of the *Handbook*. In addition, mandatory training regarding sexual harassment is required for all new employees. Continuing employees receive additional training at regular intervals.
- The Diversity Committee at Colorado School of Mines provides recommendations on the campus diversity framework, investigates and reviews issues of diversity, promotes a positive attitude toward diversity and upholds the Committee's *Statement of Commitment to Diversity*.
- The mission of *WISEM* (Women in Science, Engineering, and Mathematics) is to enhance opportunities for women in science and engineering careers, to increase retention of women students and faculty at Colorado School of Mines, and to promote equity and diversity in higher education.
- MEP, the *Minority Engineering Program*, is an academic program designed to identify, enroll, and graduate more minority students by giving minority students the resources to achieve and maintain high academic goals.
- The *Library* has policies on censorship and challenges to controversial materials and services. These policies encourage community dialog and the maintenance of a diverse collection in support of the institution's needs.

d. "transcripts that follow commonly accepted practices and accurately reflect a student's academic experience":

The American Association of Collegiate Registrars and Admissions Officers (AACRAO) published the "AACRAO Academic Record and Transcript Guide" in 1996. Pages 4-10 contain a list of transcript components described as "essential," "recommended," "optional," and "not recommended." Below are the components described under "essential" and "not recommended."

The Colorado School of Mines official transcript has the following "essential" components: name of the institution, location of the institution except for the telephone number, identification of the student, previous colleges or universities attended, terms of attendance except the dates of the terms, course identification, amount of credit, term grades, academic suspension, title of degree, date conferred, program or major, date of issue, and last entry notation. One item not shown is unit of credit.

The Colorado School of Mines official transcript does not include the following "not recommended" components: student person information such as address, place of birth, race or ethnicity, marital status, religious preference, disability, and INS status; admissions information such as high school accreditation and entrance test scores; grades from transfer credit; rank in class; and standard test scores. Included are transfer courses and credits, good standing, and academic probation.

The release of official transcripts follows FERPA guidelines. The official transcript is printed on blue safety paper and signed as an official transcript.

Resource Room
AACRAO Academic Record and Transcript Guide
Sample transcripts

e. "institutional publications, statements, and advertising that describe accurately and fairly the institution…"

The Colorado School of Mines is described accurately and fairly in its recruiting materials, its advertising, and its other publications including those listed below. These documents are updated annually and circulated widely to achieve accuracy.

- The Undergraduate and Graduate Bulletins
- The *Brunton*
- The *Graduate Student Handbook*
- The *Viewbook* and other promotional materials
- Its Web pages
- Graduate school departmental brochures

In addition, our Office of Public Affairs, which reports to the President, produces a number of campus publications. To ensure quality and consistency, all publications produced on campus are required to adhere to official campus publications guidelines, which can be found on the Public Affairs Web pages at www.mines.edu/All_about/public. Also included on the Public Affairs Web pages are the Experts Database and official CSM press releases.

In other areas, the Office of Public Affairs plans special events for the campus and maintains media and community relations. The CSM president has delegated to Public Affairs the responsibility of speaking for the institution in the day-to-day conduct of business. Through committee participation, Public Affairs staff members provide expertise to the campus in the areas of the World Wide Web site, student publications, and emergency response and crisis communications.

Resource Room
Undergraduate & Graduate Bulletins
Brunton
The Graduate Student Handbook
The Viewbook
Sample graduate program brochures

f. "relationships with other institutions of higher education conducted ethically and responsibly":

The Colorado School of Mines works frequently with other institutions of higher education, in the State of Colorado as well as nationally and internationally. We also are part of the CCHE-mandated transfer agreement with other institutions in the state and we have a special a agreement with the closest community college, Red Rocks Community College, to accept their students directly into our engineering programs provided they meet certain mutually agreed upon requirements. The CSM President serves on the Advisory Board for Red Rocks as well as the National Advisory Council of the National Renewable Energy Laboratories. We have reciprocity for graduate courses with several other State schools and the WICHE (Western Interstate Commission for Higher Education) agreement allows students from fourteen Western states to enroll in specific programs at resident tuition rates. The Vice President for Academic Affairs serves on the CCHE-led Chief Academic Officers group and on the ASEE Engineering Deans' Council. The Vice President for Finance and Operations serves on the CCHE-led Chief Financial Officers group. Other CCHE working groups have CSM representation.

In addition to these types of agreements, CSM has partnered with a variety of other institutions on academic and research programs. For example, our Center for Engineering Education is a partner with the University of Washington, Stanford University, and the University of Minnesota in a newly-funded NSF Center for Learning and Teaching. We have exchange programs with a variety of international higher education institutions. Perhaps most significantly, we are currently in the 3rd year of a 10-year agreement with the Abu Dhabi National Oil Company (ADNOC) and oil and gas multinationals (Shell, BP, TotalFinaElf, JODCO) to develop the curriculum and infrastructure for the Petroleum Institute in Abu Dhabi.

g. "appropriate support for resources shared with other institutions":

- The Library provides support for all of its reciprocal services to resource-sharing partners to ensure that all agreements and common practices are maintained. Among the support categories:
  - Documents are delivered in a timely manner to others; other institutions' materials are returned in a timely manner.

  - Information on policy changes, updates and infractions is shared appropriately.
  - Copyright laws and common practices are followed to ensure that reciprocal document agreements can be continued.
  - The Library maintains its commitment to support the information needs of selected government agencies, including the regional USGS and EPA offices.
- CSM participates in a number of joint research programs including a collaboration between the Division of Environmental Science and Engineering and the City of Golden, a variety of educational collaborations with the National Renewable Energy Laboratories, and the Colorado Alliance of Bio-Engineering.

h. "policies and procedures regarding institutional relationships with and responsibility for intercollegiate athletics, student associations, and, subsidiary or related business enterprises":

Ms. Dixie Cirillo, Assistant Director of Admissions and Financial Aid, is the CSM NCAA Compliance Coordinator. In her capacity as CSM NCAA Compliance Coordinator, Ms. Cirillo reports to Mr. Dan Lewis, Associate Director of Athletics. Ms. Cirillo is responsible for the following:

1. Certification of all CSM athletes to make sure they are eligible for intercollegiate athletics according to the NCAA guidelines.
2. Monitoring of all CSM students-athletes during the year to make sure they meet NCAA guidelines for continued participation in intercollegiate sports.
3. Monitoring of coaches and practice policies to make sure they are in compliance with NCAA guidelines.
4. Investigating and reporting all NCAA violations.
5. Collecting data for the CSM Equity and Athletics Disclosure Act and writing yearly reports.
6. Educating all Athletic Department staff and athletes in regards to NCAA guidelines.

The Office of Student Activities coordinates the various activities and student organizations on the Mines campus such as student government, professional societies, living groups, honor societies, and interest groups. Participants take part in management training, responsibility, and leadership development.

Resource Room
Student Activities Brochure
OTT documents

i. "oversight processes for monitoring contractual arrangements with government, industry, and other organizations":

Most of CSM's contractual arrangements deal with research projects and with purchased goods and services. Purchasing-related contracts for goods and services are prepared in accordance with State of Colorado guidelines and reviewed by the Director of Purchasing. Research projects, which are funded about 40% by private corporations and

60% by various governmental agencies, are closely administered through the Office of Research Services (ORS). This group reviews research contracts for alignment with Colorado contractual guidelines, sets up and monitors research budgets and spending during a project's active phase, and conducts project close-out procedures to ascertain that deliverables have been met, title to permanent equipment resolved, final billings and payments set and received, and closing documents filed.

The Office of Technology Transfer (OTT) exists to reward innovation and entrepreneurial activity by faculty and staff, recognize the value and preserve ownership of CSM's intellectual property, and contribute to Colorado's and the nation's economic growth. The OTT manages the patenting and licensing of intellectual property developed at CSM and serves as an educational resource on intellectual property and licensing matters for the CSM Community. The OTT office reports to the Vice President for Academic Affairs.

Summary of Criterion 5

Conclusion: ***We believe that CSM demonstrates integrity in its practices and relationships and therefore meets the requirements for Criterion 5.***

Strengths:
CSM continuously demonstrates integrity in its practices including its bulletins, handbooks, and promotional material, as well as in its relationships with other universities. CSM also has strong administrative oversight of research contracts.

Weaknesses:
We have discussed the need for an Ombuds Program but to date have not instituted one.

Opportunities:
We have two initiatives underway which relate to the issue of integrity: the students at CSM are proposing, and developing, an honor code for the institution. It should be drafted in the 2002-2003 academic year. Faculty responsibilities and behavioral obligations are currently found in the *Faculty Handbook* (Section 6). We are also in the process of developing an ethics-across-the-curriculum program, parallel to our very successful writing-across-the-curriculum program.

Summary

Based on our self-study process and the findings detailed in our self-study report, the Colorado School of Mines requests continued accreditation by the Higher Learning Commission.