

Science and Mathematics Division
MidAmerica Nazarene University

Self-Study Report
November 1, 2008

Academic Program Review

1. Criterion One: Mission and Integrity

Criterion Statement:

The division operates with integrity to ensure the fulfillment of its mission through structures and processes that involve the board, administration, faculty, staff, and students.

Core Component – 1A. The division’s mission is clear and articulates publicly the division’s commitments.

Examples of Evidence:

- Has the division adopted statements of mission, vision, values, goals, and office priorities that together clearly and broadly define your office’s mission?

The Science and Math Division strives to model the mission statement the university has set forth as the purpose for MidAmerica Nazarene University. Our division objectives are published in the catalog and define our mission. They are as follows:

- To offer, as a part of the general education program, an introduction to scientific concepts, mathematical reasoning, and methods of scientific research.
- To provide instruction required for continued study and specialization.
- To provide an examination of the nature, power, and limitations of scientific thought.
- To encourage a continuing interest in ecological concerns based upon mankind’s role as steward of God’s creation.
- To develop a recognition of logic as a cohesive unit which forms the basis for mathematical thought.
- To present the role of science in contemporary culture.
- To encourage a comparison of religious and scientific methodologies so that the student may develop a personal faith relating scientific discoveries and a Christian view of the world.

In addition to these general objectives for the division as a whole, each department also has more specific objectives that are also published in the catalog. These objectives are shown in Appendix 1.

- Do the division's mission, vision, values and goals statements define the varied internal and external constituencies the organization intends to serve?

Yes. In Appendix 1, you will see phrases such as:

- "As a part of the general education program."
- "For continued study and specialization."
- "Science in contemporary culture."
- "Prepare students for careers."
- "Meet the needs of non-major students who desire a broad education or specific courses for their preprofessional preparation."
- "Provide a background for graduate and medical study."
- "Equip students for work in industry and government."
- "Prepare students for careers as professionals."
- "Some will begin careers immediately upon graduation while others will attend graduate school."

- Do the division's mission statements include a strong commitment to high academic standards that sustain and advance excellence in higher learning?

The objectives of the Division of Science and Mathematics state that our students will be prepared to enter the job market or attend graduate/professional schools.

- Do the division's mission statements state goals for the learning to be achieved by its students?

They state that the students will be prepared for a variety of careers, as well as have an understanding of science and math that allows them to understand and function in the world around them.

- Does the division regularly evaluate and, when appropriate, revise its mission statements.

Yes. The divisional objectives are reviewed each year when we update the Catalog.

- Does the division make its mission statements available to the public, particularly to prospective and enrolled students.

The Division's objectives and the objectives for the individual Departments housed in the Science and Math Division are in the *MidAmerica Nazarene University Catalog*.

Core Component – 1B. In its mission statements, the division recognizes the diversity of its learners, other constituencies, and the greater society it serves.

Examples of Evidence:

- Do the division's mission statements address diversity within the community values and common purposes it considers fundamental to its mission?

The divisional objectives do not address diversity directly. However, the objectives are written in a way that they are intended to include all students.

- Do the division's mission statements present the division's function in a multicultural society?

The statements are intended to apply to all of our constituencies. Also, science is about universal phenomena. It is "multicultural" in its nature. We emphasize this in class when discussing the history of science and the scientific method.

- Do the division's mission statements affirm the organization's commitment to honor the dignity and worth of individuals?

This is a part of the MNU "Statement of Belief" found in the Catalog. It states that "individuals are of infinite worth because they are creations of God. They are integrated and complex spiritual, physiological, psychological, and social beings." This statement applies to and is endorsed by the Division of Science and Math.

- Are the division's required codes of belief or expected behavior congruent with its mission?

The *Faculty Handbook* (page 58) contains the required codes of belief or expected behavior for faculty. "As a Christian university of liberal arts, MidAmerica Nazarene University is committed to the view that in all relationships the faculty member should exemplify the spirit and fundamental principles of Jesus Christ,

the Master Teacher. The University further asserts that when he/she shares this commitment, the relationships which exist between the faculty member and students, colleagues, and church will be on a high plane..." The code of conduct goes on to describe how faculty should relate to students, colleagues, and the church. The Science and Math Division agrees with and supports this code of conduct. The entire code of belief is shown in Appendix 2.

- Do the division's mission statements provide a basis for the division's basic strategies to address diversity?

Responsible stewardship is emphasized across all cultures. As such, it is recognized that the disciplines of science and mathematics benefit from the inputs and experiences of people from all ethnicities.

Core Component – 1C. Understanding of and support for the mission pervade the division.

Examples of Evidence:

- Do the division's faculty, staff, and students understand and support MNU's mission?

Yes, all of the personnel associated with the Science and Math Division are acquainted with the mission of MNU. Prospective faculty are interviewed by the division, Associate Academic Dean, Academic Dean, and President to ensure that they agree with our mission and support it. Each year, the faculty sign a new contract that states, "The faculty member agrees to the following: to be in accord with the mission and purpose of the University."

The students are required to sign a lifestyle covenant which is designed to ensure that they follow the mission of the University.

- Are your division's strategic decisions/goals congruent with MNU's mission?

Yes. All strategic decisions made by the division must align with MNU's mission. The academic governance system is designed to ensure that decisions fit within the mission of the university.

The pre-medical program, service courses for other programs (nursing, education, physical education, etc.), and the division's extensive activity in the general education program are examples of ways that the division fulfills the mission of the university.

- Do your division's planning and budgeting priorities flow from and support MNU's mission?

Planning and budgeting priorities directly support the educational mission of the university. For example, budget priorities include approving items which enhance student education (e.g. classroom supplies, lab equipment, copies etc.), and for professional development of the faculty (conferences and continuing education). The Associate Academic Dean for Undergraduate Studies reviews all expenditures to ensure support for MNU's mission.

- Does your division articulate the mission in a consistent manner with the University?

Yes.

Core Component – 1D. The division's governance and administrative structures promote effective leadership and support collaborative processes that enable the division to fulfill its mission.

Examples of Evidence:

- Do division policies and practices document the division's focus on the organization's mission?

In addition to the divisional objectives discussing the education of students, it also addresses the spiritual development of the student. This is shown by the following statements:

- To encourage a continuing interest in ecological concerns based upon mankind's role as a steward of God's creation.
- To encourage a comparison of religious and scientific methodologies so that the student may develop a personal faith relating scientific discoveries and a Christian view of the world.

- How does the division distribute responsibilities and implement work through delegated authority?

The work within the division is delegated through division meetings or by the division chair. Everyone in the division helps to carry the workload. However, we do try to reduce the load in cases where we have new faculty members or someone who is taking graduate courses. A few examples of responsibilities within the division are given below:

- Rick Badley, Steve Cole, Paul Hendrickson, Bill Morrison and Justin Stace serve on the pre-med committee. Rick Badley is

serving as the chair of this committee for the 2008-2009 academic year.

- Scott Laird represents the division on the outcomes assessment committee.
 - Mike McLane serves as the chair of the General Education Committee.
 - Larry Haffey is the chair of the spiritual formation committee.
 - Bill Morrison serves on the Nursing admissions committee.
 - Jim Leininger served on the search committee for the Vice President for Academic Affairs, the Strategic Positioning Committee, and the *ad hoc* Policies and Procedures Development Committee.
 - Mark Brown and Jim Leininger share duties in maintaining the Math Education program.
 - Rick Badley is a member of the Professoriate Committee.
 - Everyone shares the load on academic advising. Folders for new advisees are distributed to the appropriate area coordinator. The area coordinator then divides the advisees so that each faculty member has about the same number of advisees.
- Are your division's administrators committed to the mission and appropriately qualified to carry out their defined responsibilities?

The Division Chair has been at MNU for 14 years and has served as Division Chair since 2000. The Area Coordinators also have significant academic backgrounds, years of work experience, and practical knowledge to be able to more than adequately carry out their responsibilities.

- Do your faculty and other academic leaders share responsibility for the coherence of the curriculum and the integrity of academic processes?

Every year the class schedule of each department is designed for the next academic year. The process begins with a meeting of all faculty within a department. Each department works together to complete the curriculum for its area. When it is completed it is disseminated to the division personnel who review it to ensure that the class schedule is coherent and correct.

All curriculum changes are made by the division's faculty during regularly scheduled division meetings. These decisions are documented in meeting minutes and sent to academic council and faculty assembly. See Appendix 3 for Division meeting minutes reflecting shared governance regarding curriculum and processes.

- How does effective communication facilitate governance processes and activities within your division?

Communication occurs via division meetings, emails, phone calls and meetings among the members of the division as necessary to carry out the activities of the Science/Math division.

Division meetings are held monthly throughout the academic year, more often if necessary. If a department has a proposed change, they inform the division chair and it is added to the agenda of the next meeting.

- How does your division evaluate its structures and processes regularly and strengthen them as needed?

A number of systems are in place to encourage the division to evaluate its structures and processes regularly.

- The division's outcomes assessment promotes the continuous improvement of curriculum and division structures.
- This report, the university's Academic Review Process, compels the division to evaluate its structures and processes.
- Each fall, as the catalog and class schedule are updated, some changes are made.
- Occasionally, each department reviews its entire curriculum. Chemistry made significant changes during the 2007-08 academic year. Computer Science updated its curriculum in Fall 2003 to bring it into accord with *Computing Curricula 2001, Computer Science*, a report produced by a joint task force of the Association for Computing Machinery and Institute of Electrical and Electronic Engineers. Biology is planning a major curriculum change during this academic year.

Core Component – 1E. The division upholds and protects its integrity.

Examples of Evidence:

- How are the activities of your division congruent with its mission?

We seek to ensure that our activities continue to be aligned with our mission through such things as outcomes assessment, creation of new courses, curriculum review and curriculum revision.

Faculty are encouraged to begin class with prayer or a devotional thought. Ethical components related to care of the environment, use of computer technology, and representation of laboratory results are taught. Students are encouraged to discuss controversial topics related to science and religion. An example is the “Biology Controversy” section of the General Zoology and Principles of Biology courses.

- Give examples of how the division understands and abides by local, state, and federal laws and regulations applicable to it (or by laws and regulations established by federally-recognized sovereign entities).

All faculty in the Science/Math Division are routinely apprised of appropriate laws relative to the academic process through the Faculty Assembly which is held each month. Laws and regulations are also communicated to the Division Chair by the Vice President for Academic Affairs in his monthly meeting of division chairs, who then passes them on to the division. Faculty members from the Science/Math Division have attended sessions provided by Faculty Development about copyright laws and the use of copyrighted material for educational purposes. The computer lab, under the auspices of the division, is careful to allow only software that is properly licensed to be installed on the computers and routinely monitors the computers to see that there is no illegal software installed. The division adheres to the laws related to the storage of hazardous materials working with the local fire department and university personnel. The chemistry faculty regularly (about once every two years) attend a workshop at Kansas State University on chemical waste disposal. The division is careful to follow laws related to privacy of information and to protect the privacy of students.

- Does the division consistently implement clear and fair policies regarding the rights and responsibilities of each of its internal constituencies?

Each faculty member in the Division of Science/Math has a Faculty Resource Manual, which includes a section on Faculty Advising, Faculty Development, Faculty Evaluation, a Faculty Handbook, Taking our Faith to the Classroom, FERPA Policy, Outcomes Assessment, and Student Handbook. The Division strives to adhere to all of the policies in the above mentioned documents. The

Faculty Assembly will frequently highlight some aspect of the rights and responsibilities of faculty members and students.

Course policies are clearly outlined in the course syllabi to inform the students of the class expectations on attendance, academic integrity, and other topics. Each syllabus also contains a statement that says students needing special accommodations (taking tests at Kresge center, etc.) should notify the professor during the first two weeks of the course.

- How do the division's structures and processes allow it to ensure the integrity of its co-curricular and auxiliary activities?

The co-curricular activities would include field trips, student club activities, colloquiums, division sponsored chapels, and social events. In all cases there is a faculty member involved in the planning, preparation and conduct of the activity. Only speakers who have the proper qualifications and are known to be people of integrity are invited to speak or present. Field trips are carefully planned so that the safety and well-being of the students is foremost at all times.

The pre-med committee oversees the pre-med program. They write student recommendations, interview pre-med students each year, and arrange seminars by physicians and medical school representatives.

- How does the division deal fairly with its external constituents?

- The division provides referrals and letters of recommendation to graduate schools and employers that are accurate and honest.
- MNU faculty continually seek to maintain a good relationship with medical schools. We attend a pre-med advisor's meeting at the University of Kansas School of Medicine each fall. We also invite representatives from the medical schools to come and talk to our students.
- Faculty members of the Science/Math Division have taught classes at local schools, and have participated in community events to answer questions related to their expertise.
- Computer Science students are placed in internships with local businesses.
- The biology faculty and students utilize Ernie Miller Nature Center and Prairie Center.
- Steve Cole has been a guest lecturer at Saint Mary University. He discusses what it means to be human.

- Faculty are involved with observing student teachers, going to lunch with area businessmen, taking students to visit area business establishments, and a variety of community involvements.
- The science students are encouraged to use Linda Hall Library, a private science library in Kansas City. At times, the students have been taken to the library for tours.
- Provide evidence that the organization presents itself accurately and honestly to the public.

Copies of the division's web page and catalog pages are shown in Appendix 4 and Appendix 5, respectively.

- How do you know that the division documents timely responses to complaints and grievances, particularly those of students?

Formal grievances are rare in the Science and Math Division. Most issues are handled by the student speaking directly to the professor. When student grievances are filed, they are documented in a file kept by the division chair.

If a student has a grievance, they communicate that to the division chair. The division chair serves as a liaison between the instructor and student. If a satisfactory solution cannot be worked out, the student is informed that they have the option of presenting their case to the academic dean. If the student is still not satisfied, they may request that a committee be appointed to consider the complaint. This committee typically consists of two faculty members and one student.

The university has a formal grievance procedure which provides for a written record of complaints and grievances. This is detailed in the *Faculty Handbook*, pages 57-58 (see Appendix 6).

2. Criterion Two: Preparing for the Future

Criterion Statement:

The division's allocation of resources and its processes for evaluation and planning demonstrate its capacity to fulfill its mission, improve the quality of its education, and respond to future challenges and opportunities.

Core Component – 2A. The division realistically prepares for a future shaped by multiple societal and economic trends.

Examples of Evidence:

- How do the division's planning documents reflect a sound understanding of the division's current capacity?
 - The annual report to the Vice-President for Academic Affairs is a strategic planning document which addresses the strengths and weaknesses of the division and lists the financial concerns and/or special needs that may have an impact on the next budget cycle. Appendix 7 shows the most recent annual report.
 - Each year, the division chooses 2-3 items from the Academic Dean's "Next Steps" document to address during the academic year. Appendix 8 shows the accomplishments from the 2007-08 academic year and the areas of emphasis for the 2008-09 academic year.
 - The annual budget report is also a strategic planning document which allows the division to request an increase in resources based upon the number of students served and past expenditures. In planning the 2008-09 budget, a "zero-based" budgeting method was used for the first time. Each department was asked to provide justification for their budget request. Appendix 9 shows the division's budget proposals.
 - Class scheduling documents force the division to consider room capacity and scheduling limitations.
- How do the division's planning documents demonstrate that attention is being paid to emerging factors such as technology, demographic shifts, and globalization?
 - The division has been in talks with the Criminal Justice department over the last year about the prospects of beginning a Forensic Science major. These talks began because of a perceived interest from our students. Research indicated that there is also a strong interest nationwide in forensic science. The proposed curriculum

for this program is based on recommendations from the Forensic Science Education Programs Accreditation Commission (FEPAC). At the time of this writing, the proposal has been approved by the Science and Math Division and Academic Council. It is awaiting consideration by Faculty Assembly and President's Cabinet.

- The science lab equipment has been updated in the last four years to reflect the shift in science toward instrumental methods of research or analysis.
- Computer Science updated its curriculum in Fall 2003 to bring it into accord with *Computing Curricula 2001, Computer Science*, a report produced by a joint task force of the Association for Computing Machinery and Institute of Electrical and Electronic Engineers. This curriculum change was necessary to keep up with emerging technologies.

- How do the division's planning documents show careful attention to the division's function in a multicultural society.

Diversity is addressed in the university Catalog, faculty handbook and student handbook.

- Provide an example of how your division's planning processes include effective environmental scanning.

In all cases where it is applicable, proposals which are submitted to Academic Council require the division to provide evidence that "other schools have or endorse the proposed change." See Appendix 10 for an example.

Members of the Pre-Med Committee attend annual meetings of advisors sponsored by the KU School of Medicine. At that meeting, trends in medical education are discussed and responses suggested.

Faculty researched multiple programs in Forensic Science to assess the state of the discipline and the strategies used by other schools.

- Is the division environment supportive of innovation and change?

Divisional support (funding and release time) has helped the Division become a leader in bringing technology into the classroom. New team boards, black boxes and computers have injected technological innovation into the classroom. In addition, professors have incorporated Blackboard technology into their classes for the benefit of their students. Biology maintains its own website with approximately 11,000 files (3.5 gigabytes).

Division-supported sabbaticals have allowed faculty members to become involved in research programs, graduate studies and professional work experiences that have lead to improvement of instruction.

- How does the division incorporate in its planning those aspects of its history and heritage that it wishes to preserve and continue?

Hiring is one of the main planning tools to preserve history and heritage. New hires go through a vetting process which asks the candidates to provide their philosophy of the integration of faith and learning. The hiring process includes multiple interviews with faculty, administration and students.

Performance expectations are included in annual performance reviews for faculty and provide accountability for maintaining those aspects of MNU's heritage which the university deems important (e.g. chapel attendance, student involvement, etc.).

Medical school admissions are posted on a permanent display on the 2nd floor of Osborne. Plaques are also on display throughout the division showing award winners within the division such as "Outstanding Senior Chemistry Major."

Core Component 2B - The division's resource base supports its educational programs and its plans for maintaining and strengthening their quality in the future.

Examples of Evidence:

- Are the division's resources adequate for achievement of the educational quality it claims to provide?

Significant progress has been made in recent years. The division used federal funds to replace all significant instrumentation in the Chemistry Instrument Room as well as much of the lab equipment used for "wet labs." Biology also was able to replace all of the microscopes, purchase DNA identification equipment, and update other pieces of equipment. The computers in the Metz computer lab have been updated every 4-5 years.

However there are other areas where the funds are insufficient:

- In the past, professional memberships, travel to conferences, and copies made in the Metz computer lab were paid from budgets outside the division. Those have now been placed in our budget, but our budget was not increased to compensate for the difference.

This is in effect, a large budget cut. As a result, we may not be able to travel to conferences.

- We are attempting to start research programs in chemistry and biology to increase the level of scholarly activities in the division. We asked for \$4000 to be added to our budget to purchase equipment needed to start the chemistry research program, but we were told our budget could not be increased.
 - Our facilities were last remodeled in 1989.
 - We have less space than the science departments at any of the other Nazarene universities. This is making class scheduling, especially labs, difficult.
- What division plans exist, if any, for resource development and allocation? Do these plans document the division's commitment to supporting and strengthening the quality of the education it provides?

The division initiated a "Science Pioneers Scholarship" in 2007. We are in the process of raising funds for this scholarship. The purpose of the scholarship is to honor former faculty members who have retired and to increase our number of majors.

As stated above, we are using any resources we can to purchase equipment to start research programs in chemistry and biology. This includes paying a stipend to Justin Stace and Matt Sattley to work on their research projects during the summer. These programs will strengthen the quality of education in chemistry and biology.

- Provide evidence that the division uses its human resources effectively.

Appendix 11 shows the teaching load of each faculty member over the past two years. All faculty members have approximately 24 hours of teaching load each year. Because of lab courses that count as one hour of teaching load for every two hours in lab, the contact hours approach 20 hours per week for some faculty members.

Historically the Division has maximized its use of faculty. It maintains a two-year rotation of most upper-division courses. It coordinates course offerings so that students can progress through the curriculum without course conflicts within the division. The course scheduling is so tight that if one lab in one discipline is moved, the entire division's lab schedule must change. Morning labs have been instituted to reduce competition for lab hours.

The Division is understaffed in most areas. There is little leeway to adjust for even temporary loss of a faculty person in any academic area. Nevertheless, the division attempts to reduce the load as much as possible in some cases. For example, the 2007-08 academic year was Justin Stace's first year of teaching. So he was only assigned chemistry courses and was held out of larger general education courses. This is why the number of credit hours that he generated was lower than other faculty members.

- How does your division intentionally develop its human resources to meet future changes?

Funds are provided by the University for faculty members who are working on doctoral degrees. The division faculty members participate in campus faculty development sessions. Several faculty members have been awarded sabbaticals.

Historically, the travel funds available to the division have only allowed us to travel to smaller conferences that are nearby. We have been unable to travel to major national conferences. In the past two years, this has gotten even worse. There has been essentially no funds for travel, and there has been little travel to outside conferences.

- Does the division's history of financial resource development and investment document a forward- looking concern for ensuring educational quality (e.g., investments in faculty development, technology, learning support services, new or renovated facilities)?

The Division has invested time and resources in technology development. The division updated most of the science equipment when federal funds were received by the division. This has helped us keep up with the transition of chemistry to more instrumental work and less "wet lab" chemistry.

The division guided a total remodeling of its facilities in 1989. However, our facilities are inadequate for the current course load and lab courses taught in the division.

- How are your division's planning processes flexible enough to respond to unanticipated needs for program reallocation, downsizing, or growth.

We are currently looking at the possibility of adding Forensic Chemistry and Forensic Biology majors. However, for the most part, the division is stretched very thin making it difficult to respond to changes.

- How would you show that your division has a history of achieving its planning goals.

See Appendix 8.

Other examples include: The remodeling effort of 1989 was initiated and driven by the Division itself; it wasn't on the institution's radar. The federal grant process was initiated and controlled outside the Division, but the members of the division responded in quick order to provide a list of needs, order the equipment, and provide documentation when necessary. The move toward technology in the classroom was a grassroots effort guided by an ad hoc technology committee in which the Division had heavy involvement.

Core Component 2C - The division's ongoing evaluation and assessment processes provide reliable evidence of academic unit effectiveness that clearly informs strategies for continuous improvement.

Examples of Evidence:

- How does the division demonstrate that its evaluation processes provide evidence that its performance meets its stated expectations for division effectiveness?

The Division has cooperated fully in the assessment processes of the University. We have developed expected outcomes and appropriate measures for each outcome. We have division meetings at the end of each semester to discuss our results. If we do not meet outcomes, we develop a plan to address the deficiency. Evidence of this is shown in Appendix 12 (Data Mastery Sheets for each outcome), Appendix 13 (evaluation forms for each major), and Appendix 14 (division meeting minutes).

The division has received several internal awards for its outcomes assessment work, including most improved division and best use of data to improve the program. In the 2005-06 academic year, the division was ranked 1st among all academic units at MNU. In the 2006-07, the division was ranked 4th out of 14 academic units at MNU (Appendix 15).

Additionally, all of the Division's teacher education programs were fully accredited through the Kansas State and NCATE programs.

- Provide proof that the division maintains effective systems for collecting, analyzing, and using division information.

See Appendices 12-15.

- Provide proof that appropriate data and feedback loops are available and used throughout the division to support continuous improvement (e.g. division minutes).

The division meets at the end of each semester and determines what changes should be implemented based on the assessment data (see Appendices 13-15).

- Does the division have adequate support for its evaluation and assessment processes.

Release time, equivalent to a three-hour course load, has been provided for a part-time coordinator of assessment within the Division. Scott Laird is currently filling this role.

Core Component 2D - All levels of planning align with the academic unit's mission, thereby enhancing its capacity to fulfill that mission.

Examples of Evidence:

- Coordinated planning processes center on the mission documents that define vision, values, goals, and strategic priorities for the academic unit.

The division regularly evaluates its goals with the missions of the University and the division in mind. The goals for the division and each academic department were last revised during the Spring 2008 semester. These are shown in Appendix 16.

The Next Steps document is another planning document whose purpose is to ensure that the division's goals align with the university's goals and the mission of the University. See Appendix 8.

- Planning processes link with budgeting processes.

Budget planning was changed to a "zero-based" budget form during the 2007-08 academic year. This ensures that there is a purpose for each budget line and it aligns with the mission of the University. See Appendix 9.

- Implementation of the academic unit's planning is evident in its operations.

The division's plans stated that our lab equipment needed to be updated. Based on this information, the administration obtained over \$600,000 in federal funds to purchase new equipment.

The need to keep up with changing technology led to the formation of a plan to replace the computers in the Metz computer lab every 4-5 years.

- Long-range strategic planning processes allow for reprioritization of goals when necessary because of changing environments.

The implementation of research programs in chemistry and biology would be an example of this. It became apparent that our students would benefit from a research program. When two faculty members retired, we used the opportunity to seek new hires who could lead our research programs.

- Planning documents give evidence of the unit's awareness of the relationships among educational quality, student learning, and the diverse, complex, global, and technological world in which the organization and its students exist.

Our planning documents are always based on improving the quality of our programs. In Appendix 16, you will find statements such as:

- Determine the feasibility of offering a Forensic Science major.
- Improve or replace facilities.
- Increase the involvement of the faculty in professional and community activities.
- Conduct a major curriculum change to reflect changes in contemporary biology.
- Broaden the appeal of the major in response to academic and social trends.
- Boost women majors.
- Begin research on a Web Development major.
- Connect with local Christian schools.
- Connect with home-schoolers.

- Planning processes involve internal constituents and, where appropriate, external constituents.

Planning is done by consensus within the small academic departments with all faculty members involved in curricular decisions. Course evaluations, performance appraisals and peer reviews involve stakeholders within the organization.

External constituents are consulted from time to time on a need basis and have

involved professors from other institutions, professional meetings and, particularly, the pre-med conferences at the University of Kansas medical school. The division is currently in the process of setting up a process by which we can more easily survey our alumni.

3. Criterion Three: Student Learning and Effective Teaching

Criterion Statement:

The Division provides evidence of student learning and teaching effectiveness that demonstrates it is fulfilling its educational mission.

Core Component – 3A. The division’s goals for student learning outcomes are clearly stated for each educational program and make effective assessment possible.

Examples of Evidence:

- How does your division clearly differentiate its learning goals for undergraduate, graduate, and post-baccalaureate programs by identifying the expected learning outcomes for each?

The Division of Science and Mathematics offers undergraduate degrees in Biology, Biology Education, Chemistry, Computer Science, Math and Math Education. Each major has developed “Intended Educational Outcomes” for their students (see *Appendix 13*). Students seeking the Bachelor of Biology Education and Bachelor of Math Education degrees are required to meet outcomes that will lead to teacher licensure with the Kansas State Department of Education.

- Provide proof of assessment of student learning at multiple levels: course, program, and institutional.

Proof of student learning at the course level is demonstrated through outcomes assessment documentation (see *Appendices 12 and 13*) and by course evaluations (see *Appendix 17* for the course evaluation form and some representative results). Assessment at the program and institutional level is shown through such measures as senior comprehensive exams, standardized exams, portfolios, and outcomes assessment documentation (see *Appendix 13*).

- How does your assessment of student learning include multiple direct and indirect measures of student learning?

Each student learning outcome is aligned with at least two means of assessment (see *Appendix 13 Assessment Reports: Forms C*). Several of these measures are direct measures related to course or specific assignment evaluation. Indirect measures such as graduate school admission levels and alumni surveys are also utilized through the outcomes assessment process.

- Show that the results obtained through assessment of student learning are available to appropriate constituencies, including students themselves.

All professors are required to make their grades available on Blackboard and the students have direct access to these grades. Often the students are also given a printout of all grades. Specific assignments designated for outcomes assessment are graded with rubrics or specific evaluation forms that the students receive following grading.

At the end of each semester, the division's assessment data is collected. The results are placed on the Science and Math Drive of the MNU network. Annual outcomes assessment reports are provided to the Vice President for Academic Affairs and the Associate Dean for Assessment. This data is reported to appropriate administrative bodies within the University and to the Higher Learning Commission. The registrar's office annually reports graduation rates to appropriate constituencies. (See *Appendix 18*).

- How does the division integrate into its assessment of student learning the data reported for purposes of external accountability (e.g., graduation rates, passage rates on licensing exams, placement rates, transfer rates)?

Scores on standardized exams and admission rates into graduate and professional schools are tracked as part of the outcomes assessment process (see Appendices 13 and 19). The *MNU Data book* (See *Appendix 18*) is also useful in tracking graduation rates.

- How does the division's assessment of student learning extend to all educational offerings, including credit and non-credit certificate programs?

General Education courses comprise a significant share of teaching load within the Division of Science and Mathematics. These courses are assessed through the University's outcomes assessment program based on seven criterion areas. Reporting of General Education outcomes assessment follows the same format and procedure that is utilized with divisional majors. The division does not offer any non-credit certificate programs.

- How does your division involve faculty in defining expected student learning outcomes and creating the strategies to determine whether those outcomes are achieved?

Faculty members within each department self-determine student learning outcomes and create strategies and assignments to assist students in appropriately meeting those outcomes.

- Provide evidence that faculty and administrators routinely review the effectiveness and uses of the division's programs to assess student learning.

University policy now requires division meetings specifically dedicated to reviewing and evaluating the assessment process. These meetings are held in January, to discuss the Fall semester assessment results, and in May, to discuss the Spring semester assessment results. Emphasis is placed on using assessment data to guide curricular changes. The minutes from the January 2008 and May 2008 meetings are found in *Appendix 14*.

Core Component – 3B. The division values and supports effective teaching.

Examples of Evidence:

- Prove that qualified faculty determine curricular content and strategies for instruction.

The division demonstrates that it values and supports effective teaching by recruiting and developing a highly qualified faculty that develops and delivers curricula, and by ongoing assessment of both student learning and faculty performance.

The faculty members in the division are highly qualified and experienced. The academic and professional qualifications of the faculty are presented in *Appendix 20*. Five full-time faculty members possess doctoral degrees. Three others are currently working on a doctoral degree.

The division has a mix of experience. Most of the division has several years of teaching experience. Two new faculty members have come to the division in the last two years. The experienced faculty members attempt to mentor the younger faculty.

- How does the division support professional development designed to facilitate teaching and suited to varied learning environments?

To maintain and develop their knowledge and skill in their subject areas, faculty members maintain active roles in professional organizations and lead or participate in activities relevant to their subject area. *Appendix 21* contains the recent professional memberships and activities of the full-time faculty. Professional activities most commonly include involvement in conferences or seminars under the auspices of a professional organization or university, but also include publishing papers in the subject area, service work to educate others regarding their field, and consulting in their subject area. The division has not traveled to conferences as much in the last two years due to the lack of a travel budget.

The division supports professional development by encouraging faculty members to participate in faculty development opportunities at MNU in educational technology, diversity, and learning styles. Members of the division have taken leading roles in such in-house faculty development activities. For example, Steve Cole has taught faculty development classes on providing course material on the World Wide Web. Unfortunately, due to laboratory schedules, not all faculty members in the division can be present for faculty development activities conducted during faculty assemblies, but faculty have taken advantage of other professional development opportunities offered at other times.

- Provide documents which show that the division evaluates teaching and recognizes effective teaching.

To help ensure effective teaching, the division employs the three-year faculty evaluation cycle outlined in the Faculty Resource Manual. The structure of the faculty evaluation cycle is illustrated in the following table.

FACULTY EVALUATION CYCLE

Sources of Information	Year 1	Year 2	Year 3
Professional Review	X		
Instruction Observation	X		
Student Survey	X	X	X
Self Assessment/Annual Report	X	X	X
Summative Evaluation	X	X	X

In the first year that a faculty member teaches (and in every third year after that) his/her teaching is assessed using all methods of assessment listed in the table. In the second year of teaching (and in every third year after that) a faculty member's teaching is assessed using the indicated assessment methods in the "Year 2" column of the table. In the third year of teaching (and in every third year after that) a faculty member's teaching is assessed using the indicated assessment methods in the "Year 3" column of the table. The two assessments used every year involve a self-assessment by the faculty member and a response to these from the faculty member's division chair to close the assessment loop. The "Instruction Observation" item in the "Year 1" column involves a visit by the division chair to a class session taught by the faculty member to observe the faculty member teaching. All faculty members in the division actively participate in this cyclic assessment process.

All faculty members are required to have the students fill out a course evaluation in at least one course each semester. In addition, the standard evaluation form shown in Appendix 17 must be used at least once each year. The results of the course evaluation are compiled by the division chair and a summary of the results

is sent to the faculty member and to the Associate Academic Dean for Undergraduate Studies.

- How does the division provide services to support improved pedagogies?
 - Faculty participate in and sometimes lead professional development opportunities provided by the university. These range from brown bag lunch lectures to faculty book review groups.
 - Faculty orientation provides an annual opportunity for faculty to improve their pedagogy.
 - Some members of the faculty are committed to participating in the Kansas City Professional Development Council (KCPDC) series of meetings/courses designed to introduce effective instructional and evaluation strategies for the classroom.
 - Travel funds are generally available to travel to conferences. These often concern pedagogy. Examples are the Kansas College Chemistry Teacher's Conference, the Teaching Organic Chemistry Conference, and the Math Expo. However, the funds for this travel have been limited over the past two years.
 - Some faculty have participated in the review of new editions of textbooks. In addition, images for use in textbooks and peer-reviewed, online photo collections have been accepted and published as pedagogical resources. (See Matt Sattley's vita in Appendix 26.)

- How does the division demonstrate openness to innovative practices that enhance learning?

Faculty are encouraged to incorporate and model innovation in the classroom by taking advantage of Tablet PC, Team board and Blackboard technologies. Faculty are encouraged to attend faculty development sessions where best practices are discussed.

The recent purchase of new lab equipment allows the incorporation of modern techniques into lab activities and research.

- How does the division support faculty in keeping abreast of the research on teaching and learning, and of technological advances that can positively affect student learning and the delivery of instruction?

The division provides funds for faculty memberships in professional organizations and subscriptions to periodicals. University funds are provided for some travel to professional conferences.

- What professional organizations do faculty participate in that are relevant to the disciplines they teach?

See Appendix 21.

Core Component – 3C. The division creates effective learning environments.

Examples of Evidence:

- How do assessment results inform improvements in curriculum, pedagogy, instructional resources, and student services?

The division meets regularly to complete the feedback loop and to make improvements to curriculum and student services. Student satisfaction surveys and annual performance reviews also become the basis for improvements in pedagogy and resources.

- How does the division provide an environment that supports all learners and respects the diversity they bring?

The division creates effective learning environments by providing diverse learning environments, well-equipped laboratories, appropriate technology, effective advising, and tutoring resources and referrals.

The division provides diverse learning environments for students with various learning styles as appropriate for the subject areas taught by the division. Of course, in the natural sciences structured laboratory experiences such as those found in biology, chemistry, and physics are essential to developing understanding of topics covered in lecture sessions. Structured, closed laboratory experiences are also crucial to developing knowledge and skills in computer science topics like programming and circuit theory. But many class sessions and courses taught by the division also involve students in cooperative learning teams, seminar discussion courses, computer simulations, capstone courses involving a major project in the subject area, or an internship in a professional environment away from the classroom. For example, the courses in environmental science put teams of students in the role of developing and collectively critiquing an ethic regarding stewardship of the environment. Biology students in Comparative Chordate Anatomy labs sometimes work in pairs on different animal samples and educate each other regarding their methods and discoveries. Microbiology students work in pairs, or in some cases, small groups of four to exchange ideas and complete lab activities. Chemistry majors are required to enroll in a Chemistry Research course to demonstrate their knowledge of chemistry. Computer science students use computer simulations of circuit layouts, may study current programming languages in a course taught entirely as a seminar, and are

all required to complete a successful internship with a professional organization. The division also occasionally sponsors colloquia using students or outside speakers. One recent example was a colloquium by researchers from Kansas State University into climate change who described their work collecting and analyzing ice cores from the Antarctic. Math majors have group projects in Probability and Statistics, History of Mathematics, and Numerical Analysis. The Math Club has also sponsored a viewing of “Flatland” and promoted campus-wide math awareness by sponsoring π -day.

The division provides well-equipped laboratories and laboratory staff. The Computer Science Department maintains the Metz Academic Computer Lab for computer science, mathematics, and business division students. The lab is staffed with student lab assistants who assist users and maintain the 35 PCs and two printers. The Computer Science Department has a license agreement with Microsoft Corporation to install virtually any of the company’s PC software products on PCs in the lab, or on computers owned by computer science faculty or majors. Software from other vendors like SPSS is also installed on many of the PCs. The lab is available Monday through Saturday, including evening hours on most weeknights and is used by computer science classes for closed labs. Biology, Chemistry, and Physics provide students with closed lab experiences using state of the art equipment as described below. To accommodate students with afternoon commitments like athletic practices the Chemistry Department has for several years conducted 6:30 a.m. laboratories for some chemistry courses in addition to afternoon laboratories for those courses. In addition to indoor laboratories, the Biology Department maintains an area on the northern edge of the campus called the “natural area” where it involves students in experiments and projects like habitat development.

The division also helps create effective learning environments by providing and employing appropriate technology. Many division courses make extensive use of PowerPoint presentations and online course materials using the Blackboard course management system. Biology students in several classes create and use web-based “academic papers” as part of class assignments that often include multimedia components. Beyond scientific and graphing calculators, the Mathematics Department helps Modern Geometry students explore geometric concepts using the Geometer’s Sketchpad PC software in the Metz computer lab. As a result of recent federal equipment grants the natural science laboratories operated by the division have been largely re-equipped from simple balances and glassware to major scientific instruments, including some instruments that the division did not previously possess. A partial list of new or updated scientific instruments for Chemistry labs includes a high performance liquid chromatograph (HPLC), a nuclear magnetic resonance (NMR) instrument, an ultraviolet-visible spectrophotometer, a gas chromatograph/mass spectrometer (GC/MS), a calorimeter, an infrared spectrophotometer, and an atomic absorption spectrophotometer. The Biology Department also received a number of new or updated instruments including a gel chromatograph and a Robocycler for

identifying and working with DNA, and an anaerobic chamber for use in microbiology. The Biology department has also recently upgraded its microscopes and has acquired a video microscope and “two-headed” microscopes that allow student and instructor to simultaneously view the magnified image.

- Provide evidence that your advising systems focus on student learning, including the mastery of skills required for academic success?

The division assists students in their studies through academic advising and tutoring referrals. Every student with a major in the division is offered at least one academic advisor from among the full-time faculty members. These advisors are available to meet with students during the registration period each semester and at other times as needed to plan their academic course of study. Advisors have access to student transcripts and a degree audit system for general education courses through the “Web for Faculty” Web site and also maintain advising files for each advisee. The registrar at MNU has publicly commended the Science and Math Division for ensuring that its advisees nearing graduation seldom, if at all, encounter requirements that they have not anticipated. For students in mathematics, the division has coordinated with the Kresge Center to provide COMPASS math placement testing software. This software is used to help determine the entry-level mathematics course in which a student begins (e.g., Fundamentals of Math, Intermediate Algebra, College Algebra and Trigonometry, Analytic Geometry and Calculus I, Applied Math with Statistics, and Probability and Statistics) so that the student is likely to have the necessary knowledge and skills to succeed. The division also supports the Kresge Center tutoring program by offering recommendations of students to tutor in subject areas taught in the division. In addition to assisting students directly, faculty members also refer students who need various levels of assistance to Kresge Center tutors for assistance.

The division also provides a pre-med committee that is responsible for advising students interested in various careers in the medical field. In addition to advising the students, the committee interviews each student every year. The interviews are used to check on the progress of the student, share information with the student, and prepare the student for their interview for medical school or other professional schools.

- Give examples of how your division has employed, when appropriate, new technologies that enhance effective learning environments for students.

This is discussed previously, in the second question under Criterion 3C.

- How do the division's systems of quality assurance include regular review of whether its educational strategies, activities, processes, and technologies enhance student learning?

The division uses the results of outcomes assessment to modify the curriculum to meet student learning outcomes. The minutes of the two outcomes assessment division meetings for the 2007-08 academic year are shown in Appendix 14.

Some examples of changes that resulted from the outcomes assessment process in the past two years are:

- The Chemistry Department added two new labs to the Organic Chemistry course due to specific problems that students demonstrated on the standardized exam used at the end of the course.
- The Computer Science Department added an earlier, additional object-oriented programming project in the Data Structures course in response to student deficiencies in the object-oriented programming project that students complete during the latter half of the course.
- The Mathematics Department is devoting two extra class sessions on applications of differential equations in the Differential Equations course based on problems with student scores on this area of the final exam.
- The Chemistry Research course and Senior Comprehensive exam were revised to strengthen the assessment.
- Links to web sites explaining the scientific method in Zoology were added to the lab schedule.
- The Princeton Review Exam was used by students to prepare for the Major Field Test in Biology.
- On-line quizzes with automatic feedback are being instituted in the General Chemistry course.
- MathZone® (an electronic homework grading system) is being introduced in the Probability and Statistics course.

Core Component – 3D. The division’s learning resources support student learning and effective teaching.

Examples of Evidence:

- How does the division ensure access to the resources (e.g., research laboratories, libraries, performance spaces, clinical practice sites) necessary to support learning and teaching?

Applied learning experiences through laboratory assignments are a primary teaching component in the Division of Science and Mathematics. Computer Science students have a computer lab that is designated primarily for their use. Chemistry and Biology students have planned lab times and locations. Early morning lab times are offered as an option to accommodate student work and sports schedules. At many schools, lab analysis completed by sophisticated lab equipment may only be conducted by lab assistants or professors. Division philosophy and relatively small class sizes allow all of our science students to use such analysis equipment. In addition to the formal lab settings, students are also provided access to a division conference room that they can utilize as a study room.

The division has a library budget that is utilized to update research and informational resources. Given the high cost of modern resources, it has been difficult to adequately maintain proper materials with our limited budget. The library staff, however, has been very cooperative and efficient in assisting the division in providing specific databases and periodicals that meet a wide range of needs. Students are also provided access to some professional periodicals and video learning resources within the division.

Each faculty member has received updated personal computers – lap or desk top, depending on preference -- for their individual use. The computers are connected to the University network and the Internet. Microsoft Office, Micrograde and Blackboard software are just some of the computer resources that are provided and maintained for faculty. Each faculty member also has access to the division’s laser jet printers, copier and fax machine.

Our faculty is encouraged to consider appropriate use of technology for instructional delivery, class communication, and course evaluation. Almost all faculty members have taken advantage of recent faculty development training sessions on using PowerPoint, Micrograde or Blackboard. Steve Cole and the Biology Department have provided leadership in digital course delivery. Half of all Biology courses are digitally presented and supported. Three on-line courses have also been fully developed through the department.

Technology use is also supported through the granting of sabbaticals and through conference or seminar attendance. Rick Badley used his sabbatical to gain

knowledge and expertise on some of the new chemistry analysis equipment and develop lab exercises that utilize the equipment. Other faculty have attended computer skills conferences and taken educational seminars on integrating technology into the curriculum. Jim Leininger takes the junior and senior math students to a technology expo where they can view and experiment with current mathematical technology.

Technology usage is a key component of several of our majors. Computer Science majors learn to develop, utilize and apply current software and hardware applications. Chemistry and Biology majors use laboratory equipment to analyze material composition, synthesize compounds, and identify microscopic organisms (to name just a few examples). Math majors focus on application skills related to calculators and spreadsheet analysis using Excel. In the Modern Geometry class, students are provided instruction and allowed access to the course software “Geometer’s Sketchpad.” The Math department also uses “Mathematica,” “Geogebra,” and “GAP” (Groups, Algorithms, and Programming) software. Mathematica is a modern, powerful software package with a wide-range of computational and mathematical applications. Lab assistants are available for many of the related courses to help students operate the technology and develop proper utilization skills.

The division maintains two natural areas that are used for biological studies, a community garden, and demonstration of “green consciousness” on the campus. It also contains a prayer walk for campus contemplation and meditation.

- How does the division evaluate the use of its learning resources to enhance student learning and effective teaching?

In the past, most of our evaluations of learning resources have been conducted through informal methods. Conferences, professional seminars, technology expos and personal contacts with other Science and Mathematics professionals often inform faculty of new ideas or technology that we may be lacking. Student feedback through course evaluations or instructor recognition of lacking resources may also be the impetus for implementing any changes in resources. Following the outcomes assessment plan will help the division with resource evaluation in areas closely related to specific learning outcomes.

- How does the division regularly assess the effectiveness of its learning resources to support learning and teaching?

See previous question.

- How does the division support students, staff, and faculty in using technology effectively?

Regular training (e.g. Blackboard training, Team board training, Banner training) is provided to staff and faculty which supports the use of technology. IT and Kelvin St. John are available for individual assistance.

The student's are provided extensive hands-on use, under the supervision of a professor or lab assistant, of lab equipment and the Metz computer lab.

- Does the division have effective staffing and support for its learning resources?

Resource staffing and support can sometimes be an issue. The number and quality of available lab assistants and student helpers often varies, but they are valuable assets to the division. Support staff in MNU's Information Technology Department are extremely helpful – despite what seems to be a very heavy work-load. The Mabee Library staff is also very helpful and cooperative in providing the best services they can to assist us with academic needs.

Staffing issues do influence potential course offerings and programs within the division. Inability to fund a professional assistant to manage the “animal room” laboratory resulted in the discontinuation of that component of the Biology program. The Math Department relies heavily on adjunct instructors to teach Math and Math Education courses. We have had some consistent, high quality adjuncts but some positions are difficult to fill and the lack of continuity in some courses is less than ideal.

- How do the division's systems and structures enable partnerships and innovations that enhance student learning and strengthen teaching effectiveness?

Internships in the Computer Science department provide a working partnership with local businesses.

The division has conducted preliminary discussions with representatives of the Kansas State University Biosciences center that is being developed in Olathe. We are attempting to form a working relationship with them. This partnership would take advantage of the new lab instruments that have been purchased in the last few years.

- Do budgeting priorities reflect that improvement in teaching and learning is a core value of the organization?

Academics are the primary purpose of the institution and the operating budget reflects that priority. Aside from salary considerations, most division/department budgets have not increased much – if at all – for some time. Given the tight budget constraints, there is no reason for academic divisions to spend money on

items that are not closely related to teaching and learning functions.
Departmental budgets for the 2005-06 year are displayed in *Appendix 22*.

4. Criterion Four: Acquisition, Discovery, and Application of Knowledge

Criterion Statement:

The division promotes a life of learning for its faculty, administration, staff, and students by fostering and supporting inquiry, creativity, practice, and social responsibility in ways consistent with its mission.

Core Component - 4A. The division demonstrates, through the actions of its administrators, students, faculty, and staff, that it values a life of learning.

Examples of Evidence:

- How does the division's planning and pattern of financial allocation demonstrate that it values and promotes a life of learning for its students, faculty, and staff?

Division funds are made available to faculty, staff, and students to participate in professional development activities. Division funds are also used to subsidize membership in professional organizations.

A large proportion of the division budget is used for technology and lab equipment to give the students more “real-life” experience.

Funds are available for several seminar speakers each academic year. These speakers have included medical school representatives, physicians, scientists, mathematicians, and others.

The Division has some scholarship money designated for our majors.

Students have been taken to conferences (e.g. Math Expo).

- Provide evidence that the division supports professional development opportunities and makes them available to all of its administrators, faculty, and staff.

Funds are generally provided for faculty to travel to and participate in professional development activities, although these funds have been very limited over the past two years. See *Appendix 21* for a list of conferences attended in recent years.

Faculty are supported in Doctoral programs (currently Jim Leininger, Scott Laird, Mark Brown, and Justin Stace).

Faculty participate in professional development activities on campus. This has involved activities such as the President’s Breakfast, book studies, technology training, and many others.

Faculty from the division met with the President of the University to discuss the controversy surrounding Rick Colling's book "Random Designer."

Teddea Hewitt has participated in training sessions provided by the university (e.g. Banner training) and W.O.W. luncheons.

Adjunct faculty participate in a one-day orientation program organized by the academic dean.

- How does your division publicly acknowledge the achievements of students and faculty in acquiring, discovering, and applying knowledge?

Accomplishments, publications, and professional memberships of faculty are listed in a brochure distributed annually at the Academic chapel.

Student accomplishments are recognized at an annual Honors convocation.

Hallway plaques recognize students who excel in Departmental tests, are considered the outstanding senior major, or who are admitted to medical or dental school.

Students who have participated in summer research programs have presented departmental seminars on their work.

- How does the faculty and students, in keeping with the organization's mission, produce scholarship and create knowledge through basic and applied research?

The phrase "in keeping with the organization's mission" is significant. MNU is primarily a teaching institution rather than a research institution. Teaching and service are given more emphasis than creation of knowledge through basic and applied research. Even so, with the addition of Justin Stace and Matt Sattley to the faculty, student research programs are being started in chemistry and biology. Chemistry majors are required to complete CHEM 4803 Chemistry Research.

- How does your division use scholarship and research to stimulate organizational and educational improvements?

The chemistry curriculum was extensively revised in 2007. This included changing the Senior Project course to a Chemistry Research course. This allows the course to concentrate more on research, instead of other things such as the senior comprehensive exam, which was part of the course in the past. It also allows the students to complete their research course during the junior year. Then if they choose, the students can take a second research course, CHEM 4973 Directed Research, during their senior year.

With the addition of Matt Sattley to the faculty, the biology department is planning a major curriculum revision this year. This revision will include a research component.

Division faculty have assisted the institution with organizational improvements (e.g. Prof. McLane's work with Banner; Steve Cole and Larry Haffey's work on the technology Committee).

Faculty examine the current recommendations of professional organizations for incorporation into their courses.

At least one of the Pre-Med advisors meets annually with Medical School officials.

Core Component - 4B. The division demonstrates that acquisition of a breadth of knowledge and skills and the exercise of intellectual inquiry are integral to its educational programs.

Examples of Evidence:

- Show how your division integrates general education into all of its undergraduate degree programs through curricular and experiential offerings intentionally created to develop the attitudes and skills requisite for a life of learning in a diverse society.

All degrees offered by the Division contain a strong general core component of 43-56 semester hours, or about 40% of the 126 semester hours of coursework required to graduate.

The Division participates in the University's general education program by offering the following fifteen core courses:

BIOL 1003 Principles of Biology
BIOL 1104 General Zoology
BIOL 1504 Anatomy and Physiology I
BIOL 3003 Human Genetics
CHEM 1104 General Chemistry I
COMP 1303 Computing for the Liberal Arts
GNSC 1003 Concepts in Physical Science
GNSC 2003 Agriculture and Sustainable Food Systems
GNSC 3703 Human Nutrition
GNSC 3801 Environmental Stewardship
GNSC 3803 Environmental Science
MATH 1103 Intermediate Algebra
MATH 2503 Applied Mathematics with Statistics
MATH 3503 Probability and Statistics
MATH 3703 Statistics

- How does your division regularly review the relationship between its mission and values and the effectiveness of its general education?

Outcomes assessment data is collected for each general education course. It is reviewed by the division and by the General Education Committee. The Junior Comprehensive Exam, which is administered by the General Education Committee, is designed to evaluate the effectiveness of the general education program.

Regular program reviews are conducted by the University. In addition, Math Education and Biology Education participate in reviews for KSDE and NCATE.

- Provide evidence that you assess how effectively your graduate programs are in establishing a knowledge base on which students develop depth of expertise.

Not applicable. The Division offers no graduate programs.

- How does your division demonstrate the linkages between curricular and cocurricular activities that support inquiry, practice, creativity, and social responsibility?

The Division sponsors a Medical Careers Club. As part of the program, the division sponsors seminars for the students and faculty. One recent example was a seminar presented by an MNU alum, Scott Henning. He discussed his career as a physician in the military. Although the trips are not organized by the Medical Careers Club itself, students have also participated in medical work-and-witness trips and other international experiences.

- Show how your division's learning outcomes demonstrate that graduates have achieved breadth of knowledge and skills and the capacity to exercise intellectual inquiry.

The division has an outcomes assessment plan and process which demonstrates that graduates have achieved a breadth of knowledge and skills and the capacity to exercise intellectual inquiry. Means of assessment include the Senior Comprehensive Exam, standardized tests from the American Chemical Society, ETS field exams in biology and computer science, portfolios, embedded projects, etc. Assessment meetings are held each semester to evaluate and discuss the results. See Appendices 12-15.

Pre-med students must also take exams such as the MCAT or DAT. Students wishing to attend graduate school must take the GRE exam. The students achievement on these exams and their admission into graduate or professional programs demonstrates that our academic programs have given them the appropriate skills.

- How do your division's learning outcomes demonstrate effective preparation for continued learning?

Many graduates of the Division go on to graduate, medical, and other professional schools each year.

Recent examples include:

Jeremy Lyle
Ken Parker
Debbie Buxie Jasiczek
Andy Shaw
Heather Blossey
Jamie Lyle
Tanner Auch
Aimee Robinson
Jamin Graham
Bethany Enoch
Lisa Ruckman
Alan Kovar
Kristin Thornton
Kimberly Graham
Lisa Najarian
Jonathan Burns
Kelly Willbanks Bisel

Core Component - 4C. The division assesses the usefulness of its curricula to students who will live and work in a global, diverse, and technological society.

Examples of Evidence:

- How do your division's regular academic program reviews include attention to currency and relevance of courses and programs?

By maintaining NCATE accreditation the Biology Ed and Math Ed programs of the Division are required to meet the most current standards set up by this professional organization.

The Computer Science curriculum follows the guidelines set by the Association for Computing Machinery.

Much of this is accomplished through environmental scanning. We pay attention to what other programs are offering. Academic conferences, publications, and the internet are important tools for accomplishing this task.

- In keeping with its mission, how do your division's learning goals and outcomes include skills and professional competence essential to a diverse workforce?

Biology Education and Math Education majors take a course in cultural diversity issues.

A scholarship is available for women going into medicine.

- How do your learning outcomes document that graduates have gained the skills and knowledge they need to function in diverse local, national, and global societies?

The University's General Education program ensures that the students receive a broad educational background that allows them to function in diverse environments.

While the division's outcomes do not specifically address diversity, our programs are intended to give the students as much real-life experience as possible and prepare them for a range of careers. Our students have gone many directions upon graduation, including: graduate school, medical-related programs, engineering programs, industry, analytical labs, education, computer programming companies, careers as actuaries and statisticians, and many others.

- Give examples of how curricular evaluation involves alumni, employers, and other external constituents who understand the relationships among the courses of study, the currency of the curriculum, and the utility of the knowledge and skills gained.

Professors talk with recent graduates to obtain appropriate feedback on the preparation provided them by our curriculum.

Cooperating teachers provide information about our Biology Education and Math Education student teachers.

- How does your division support creation and use of scholarship by students in keeping with its mission?

Courses require design of lab experiments and writing up of results. In chemistry and microbiology labs, the results must be kept in a research-style notebook just as they would in a research career.

In Chemistry Research, the students must keep a research-style notebook and write a report in the format of a chemistry journal. The students are also required to give an oral defense and project update.

Physiology students "publish" the results of their experiments in standard science report format on a web page that features data, graphic analysis, photos, and movies of their experiments.

Research papers are required in several classes throughout the curriculum. These develop the student's writing abilities and their ability to search the professional literature.

A number of students have participated in summer research programs at institutions such as the University of Nebraska, University of Kansas, North Texas State University, Colorado State University, and Los Alamos National Science Lab.

- Show that Faculty expect students to master the knowledge and skills necessary for independent learning in programs of applied practice.

Standards for outcomes assessment ensure that students will demonstrate competence in skills necessary for success in their chosen program of study.

Computer Science majors are required to complete an internship for graduation - this involves doing independent study in an applied way.

The Chemistry Research course requires the students to work independently.

In some lab courses, the students are often required to work on slightly different experiments from their classmates, requiring critical thinking and independent learning. One example of this is a lab in Organic Chemistry in which each student is required to make a unique chemical compound used in the flavor and fragrance industry. While the lab procedures are similar, they must be able to apply the procedure to their particular compound to complete the lab successfully. They cannot just follow the lead of the other students in the lab.

- What curricular and cocurricular opportunities does your division provide that promote social responsibility?

In Environmental Science and Environmental Stewardship, each student is required to write a Land Ethic in which they specify what they feel should be done in relation to environmental issues.

Chemistry students must learn the appropriate methods for handling and disposing of hazardous chemicals.

Most students participate in activities (e.g. mission trips, local church and social agencies programs) which promote social responsibility.

Core Component - 4D. The division provides support to ensure that faculty, students, and staff acquire, discover, and apply knowledge responsibly.

Examples of Evidence:

- What division academic and student support programs exist which contribute to the development of student skills and attitudes fundamental to responsible use of knowledge?

Teaching methods courses and the Environmental Science course help students develop skills and attitudes for responsible use of knowledge.

Computer Science students are required to take COMP 3203 Social and Professional Issues.

Lab courses stress safety and environmental issues involving chemicals and equipment.

- How does your division follow explicit policies and procedures to ensure ethical conduct in its research and instructional activities?

Statements on academic integrity are included in course syllabi. Two examples are given in *Appendix 23*.

The Student Handbook contains a section with specific examples of issues of academic integrity. See *Appendix 24*.

Violations of academic integrity are dealt with by professors and/or reported to the Academic Dean.

- How does your division encourage curricular and cocurricular activities that relate responsible use of knowledge to practicing social responsibility?

Courses such as Environmental Science, Environmental Stewardship, Human Genetics, Social and Professional Issues, and Statistics have ethical components.

- How does your division provide effective oversight and support services to ensure the integrity of research and practice conducted by its faculty and students?

Reference is made to academic integrity policies in the division's course syllabi (see *Appendix 23*). In addition, professors use tools such as the internet and "turn it in.com" as a procedure to ensure ethical academic conduct. The division follows MNU's guidelines for dealing with academic integrity violations once they become apparent. Students are trained in the correct methods and uses of research.

- How does your division create, disseminate, and enforce clear policies on practices involving intellectual property rights?

The university has strict guiding principles regarding the intellectual property rights of others which are available in the MNU Student Handbook (see *Appendix 24*). The division notifies students about these policies by referring to them in the division's course syllabi (see *Appendix 23*). The division enforces these policies by looking for violations during grading and by providing appropriate consequences for infringements.

5. Criterion Five: Engagement and Service

Criterion Statement:

As called for by its mission, the division identifies its constituencies and serves them in ways both value.

Core Component – 5A. The office learns from the constituencies it serves and analyzes its capacity to serve their needs and expectations.

Examples of Evidence:

- How are your division's commitments shaped by its mission and its capacity to support those commitments?

The Division of Science and Mathematics service constituency includes internal constituencies such as students majoring in division programs, other academic divisions and educational units whose programs require division courses, and the University to meet general education core requirements.

The Division's external constituencies include business and industry, graduate schools, medical schools, science and mathematic learned societies, and K-12 educational units.

The Division has primarily arrayed its resources to offer a wide range of courses and programs designed to meet the needs of its internal and external constituencies. In keeping with the University's mission, all courses are taught through the lens of a Christian faith.

- Give examples of how your division practices periodic environmental scanning to understand the changing needs of its constituencies and their communities.

The University's assessment program includes performance evaluations of faculty and programs and inputs from the various internal constituencies. In addition, the faculty identifies the changing needs of graduate schools, medical schools, and pertinent learned societies by attending conferences, meeting with graduate faculty, and continuing education. Also, the computer science major's internship program, secondary education practicums, and student teaching for biology and mathematics education students provide connections to practitioners in business and education and awareness of industry changes.

We regularly seek information from other divisions that are supported by our courses. For example, we had several meetings with the Nursing Division last year. One result of these meetings was the deletion of the Nursing nutrition course. The Nursing students will now be taking our Human Nutrition course. We added a Finite Math course at the request of the Business Division. We have

been discussing the possibility of a Forensic Science program with the Criminal Justice Department.

- How does your division demonstrate attention to the diversity of the constituencies it serves?

As stated in the previous question, the division's students take a variety of career paths. As much as the budget and personnel allow, the division attempts to offer a wide range of rigorous academic courses that support these varied careers.

- How do the organization's outreach programs respond to identified community needs?

Although the Division of Science and Mathematics supports various internal constituencies possessing outreach programs, the Division does not currently sponsor its own outreach programs.

However, there are two areas that the division may enter in the future. The division has conducted a preliminary discussion with officials from the Kansas State Bioscience Center to determine how Biology and Chemistry can be involved in this venture. The division has submitted a proposal to start a Forensic Science program. If this program is instituted, it will require a working relationship with the Johnson County Crime Lab and other crime labs in the area.

- How is your division well-served by its outreach programs such as continuing education, customized training and extension services?

Although the Division of Science and Mathematics supports various internal constituencies possessing outreach programs, the Division does not currently sponsor its own outreach programs.

Core Component – 5B. The division has the capacity and the commitment to engage with its identified constituencies and communities.

- How do your division's structures and processes enable effective connections with its communities?

For the Division's internal constituency, many avenues of communication exist. Students have access to faculty members before and after class, in faculty offices, during labs, as faculty members participate in campus activities or even as students are invited to faculty homes. Student input is also part of the University assessment program. Other internal constituencies have access to the division via the University committee structure or direct meetings.

One or two members of the pre-med committee attend the pre-med advisor's meeting at the University of Kansas School of Medicine each Fall, and a

representative from the KU School of Medicine meets with our students every Spring. Mike McLane has worked part-time for computer software companies in the area, giving him a first-hand view of current trends. Other connections with external constituencies currently tend to be more informal.

- How do your division's co-curricular activities engage students, staff, administrators, and faculty with external communities?

Through the pre-med program, representatives of medical schools and physicians present seminars for students. Information is also presented to students regarding opportunities to attend functions at local medical schools, shadow physicians, etc.

- How do your division's educational programs connect students with external communities?

The Division encourages and has financially supported students to attend local and regional conferences addressing science, mathematics, and technology. In fact, in recent years a pattern has developed for mathematics and computer science students to attend the Kansas City Technology Expo. Computer science majors participate in an internship program, which helps students connect to technology employers. Also, biology education and mathematics education majors connect with education professionals via student practicums and student teaching experiences. Some chemistry students have participated in summer research programs at other universities and national labs. The students are given academic credit for the work, and they present a seminar to other science students.

- Do your division's resources-physical, financial and human-support effective programs of engagement and service?

Most of the Division's budget supports its educational mission and its internal constituencies. The University provides financial support to attend conferences, to maintain academic memberships, and to provide some training, especially with regards to technology such as Blackboard and PowerPoint.

- How do your division's planning processes project ongoing engagement and service?

The Division's current long-term planning process has been guided by the recent University initiative "Next Steps—Goals for Academic Affairs." As this process unfolds, the Division will more actively make long-term planning goals directed towards service for external constituencies. This process is shown in Appendix 8. During the 2007-08 academic year, one of our areas of emphasis was to "begin to study the social and economic problems of local and metro communities and ways MNU can assist." Some areas that the division identified for possible participation in the future are:

- Visit local schools, especially Christian schools.
- Participate in science fairs, etc.

Continue talks with representatives of the K-State bioscience center.
If a forensic science major is started, we need to develop a relationship
with the Johnson County Crime Lab.

As regards internal constituencies, short-term planning and long-term planning
derives from division meeting, department level discussions, and responses to the
assessment process.

**Core Component – 5C. The division demonstrates its responsiveness to those
constituencies that depend on it for service.**

- Describe any collaborative ventures that exist with other higher learning
organizations and education sectors (e.g., K-12 partnerships, articulation
arrangements, 2+2 programs).

The University has developed a specific administrative unit to collaborate with
local school districts to provide advanced training for teachers to meet graduate
and state licensure requirements. Division science faculty members have helped
to develop curriculum and teach courses for MACC Science Projects such as *Life
Sciences for Middle School Teachers*, *Using Life Sciences in the Classroom*,
Physical Sciences for Middle School Teachers, and *Using Physical Sciences in the
Classroom*.

The biology department has conducted classes and outdoor labs for elementary
and middle school students and special needs students, including studies of teeth,
observations of the fall season, observing natural systems, and insects.

The division is associated with the Au Sable Institute of Environmental Studies,
where students can spend a semester in various off-campus studies program.
However, no students have participated in the program in the last few years.

- How do your division's transfer policies and practices create an environment
supportive of the mobility of learners?

Many transfer credits are accepted from other accredited colleges and universities.
The student must present a course description and transient student form to the
appropriate Area Coordinator and the Division Chair to show that the course
meets MNU's academic standards.

In many cases, we feel that the University's transfer policies are too lenient,
allowing current MNU students to shop around for the easiest or the cheapest
course. The division is also troubled that in some cases, another division is
allowed to sign the transient student form allowing science classes that we have
considered inadequate to be transferred. In bypassing the division, the University
has lost one of the major checks to ensure quality of transfer classes.

- Give examples of community leaders who testify to the usefulness of the organization's programs of engagement.

The Division currently does not formally conduct co-curricular activities or joint ventures that engage external communities.

- How do your division's programs of engagement give evidence of building effective bridges among diverse communities?

The Division's programs do not overtly endeavor to build bridges among most diverse communities. The Division does coordinate a number of scholarships and awards. Many of these scholarships, at least in part, are awarded based on financial need and are used to encourage disadvantaged students.

- How does your division participate in partnerships focused on shared educational, economic, and social goals?

The Division currently does not directly participate in partnerships on shared educational, economic and social goals. Division faculty members do assist other administrative units that build such partnerships focusing on nursing education, secondary education in science and mathematics, graduate education (MBA), and non-traditional education (IAE).

- Do your division's partnerships and contractual arrangements uphold your office's integrity?

The Division does not have external partnerships nor contractual arrangements.

Core Component – 5D. Internal and external constituencies value the services the division provides.

- How do your division's evaluation of services involve the constituencies served?

Evaluation of services provided to internal constituencies is guided by the University's assessment and General Education assessment programs. Evaluation of external constituencies is less formal and has involved feedback from cooperating public school educators, internship supervisors and employers, recommendations from learned societies, compliance with criteria developed by Kansas State Regents or Kansas Department of Education, and meetings with regional medical school personnel.

- Provide proof that service programs and student, faculty, and staff volunteer activities are well-received by the communities served.

Some sections of *Environment Stewardship* and *Environmental Science* require students to complete a service project.

Many faculty members hold positions of responsibility in their local church or volunteer in community organizations. Some examples are given below.

- Rick Badley
 - Sets up all media and runs presentations for church services
 - Member of the worship leadership team
- Steve Cole
 - Usher at church
 - Sunday School teacher
 - Coordinator for church prayer garden
- Larry Haffey
 - Adult Bible Study Fellowship teacher
 - Usher
 - Nazarene Missions International Council member
 - Senior Citizens Committee at church
 - Archive Committee at church
 - Provide food for, cook, and serve a meal each year at the Kansas City Rescue Mission
 - Work on the Olathe Community Service Day each year.
- Mike McLane
 - Co-director of Men's Fraternity small group workshop at church
 - Prayer coordinator for the New Covenant Adult Bible Study Fellowship
- Bill Morrison
 - Has taught Sunday School classes
- Matt Sattley
 - Participated in church worship team
 - Served on church building maintenance team

- Provide evidence that your division's economic and workforce development activities are sought after and valued by civic and business leaders.

Many of the division's pre-med students attend the University of Kansas School of Medicine or the Kansas City University of Medicine and Biosciences College of Osteopathic Medicine. Many computer science graduates have obtained positions at Garmin. Biology Education and Math Education students are sought by local school districts. The fact that these prominent local institutions repeatedly accept our students indicates that they are happy with the quality of our graduates.

- How do your external constituents participate in your office's activities and co-curricular programs open to the public?

The Division occasionally sponsors seminars on our campus which are open to the public.

- How are your office's facilities available to and used by the community?

The Division's facilities currently are widely available to our internal constituencies. Science majors, service majors (such as nursing and criminal justice), and students enrolled in general education science courses have access to modern equipment and labs. External communities have a much more limited access, but some groups such as local home-schooling children do occasionally make use of the facilities.

- What programs does your office provide to meet the continuing education needs of licensed professionals in its community?

The University has developed a specific administrative unit to collaborate with local school districts to provide advanced training for teachers to meet graduate and state licensure requirements. Division faculty members have helped to develop curriculum and teach courses for this program.

6. Response to Previous Program Review Cycle Recommendations

There have been no previous reviews or self-studies where recommendations of the Vice President for Academic Affairs were presented to the Division.

7. Appendices

The Office of Institutional Research provided the Division with available factual and descriptive data which is included in *Appendix 25* of the report. In addition, other verifications of program quality have been included in the Appendices for the committee to review.

Appendix 26 shows curriculum vita for the division's faculty.