

Annual Assessment Report

2012-2013

School of Mathematical and Natural Sciences

This assessment report is available through the School homepage at
http://www.uamont.edu/Math_and_Sciences/annualreports.htm

July 2013

1. What are the Student Learning Outcomes (SLOs) for your unit? How do you inform the public and other stakeholders (students, potential students, the community) about your SLOs? If your unit is accredited by an outside source, please attach the letter verifying your accreditation.

A student who graduates from UAM with a major administered by the School of Mathematical and Natural Sciences should:

1. Be able to clearly express mathematical and/or scientific ideas in oral and written communication;
2. Be able to demonstrate the ability to apply scientific and/or mathematical concepts to real world situations;
3. Have a core knowledge of the major discipline;
4. Be prepared for immediate employment in a scientific, technical, medical, or educational environment;
5. Be prepared to enter graduate or professional school in the appropriate area.

The Student Learning Outcomes (SLOs) are measured through student performance on exams, quizzes, laboratory exercises, field course journals, homework assignments, research projects, reports, and/or presentations.

The Student Learning Outcomes are posted on the School of Mathematics and Natural Science website at: http://www.uamont.edu/Math_and_Sciences/learningoutcomes.htm. They are also posted in the two display cases near the front entrance to the Science Center.

External Accreditations: None

2. Describe how your unit's Student Learning Outcomes fit into the mission of the University.

The mission the University of Arkansas at Monticello shares with all universities is the commitment to search for truth, understanding through scholastic endeavor. The University seeks to enhance and share knowledge, to preserve and promote the intellectual content of society, and to educate people for critical thought. The University provides learning experiences that enable students to synthesize knowledge, communicate effectively, use knowledge and technology with intelligence and responsibility, and act creatively within their own and other cultures.

The University strives for excellence in all its endeavors. Educational opportunities encompass the liberal arts, basic and applied sciences, selected professions, and vocational/technical preparation. These opportunities are founded in a strong program of general education and are fulfilled through contemporary disciplinary curricula, certification programs, and vocational/technical education or workforce training. The University assures opportunities in higher education for both traditional and non-traditional students and strives to provide an environment that fosters individual achievement and personal development.

Student Learning Outcomes (SLOs) 1, 2, and 3 address aspects of UAM's mission that are related to the commitment to search for truth and understanding through scholastic endeavor. These SLO's focus on teaching students to have core knowledge in their discipline, be able to apply the basic core knowledge to real world situations, and effectively communicate scientific information orally and in writing. Students in Math and Sciences learn specific information related to their discipline, and also the historical aspects of the advancements made in their field, including advancements made in their specific fields related to improved technology found in today's instrumentation.

SLOs 2 and 3 support the University's goal to enhance and share knowledge, promote the intellectual content and promote critical thinking. Students in Math and Science majors learn many basic concepts early in their college career, and as the courses become more in depth, critical thinking skills are enhanced as understanding of content, applications, and connections to more complicated systems are made through course content, papers, laboratory projects, and research.

SLO's 4 and 5 address the preparedness of Math and Science majors to enter the workplace or enter a graduate program in a related field. The general education component of the degree plans for math and science majors provides a broad background in the liberal arts and basic and applied sciences. Supportive requirements provide additional background in the sciences and mathematics, and the courses in the major provide specific content and serve as the basis for critical thinking and problem solving skills that will enable a graduate to enter the workplace, a professional program, or a graduate program in a related area.

UAM MISSION STATEMENT	Math and Science Learning Outcomes
The mission the University of Arkansas at Monticello shares with all universities is the commitment to search for truth, understanding through scholastic endeavor.	1,2,3
The University seeks to enhance and share knowledge, to preserve and promote the intellectual content of society, and to educate people for critical thought.	2, 3
The University provides learning experiences that enable students to synthesize knowledge, communicate effectively, use knowledge and technology with intelligence and responsibility, and act creatively within their own and other cultures.	1, 2, 3
The University strives for excellence in all its endeavors. Educational opportunities encompass the liberal arts, basic and applied sciences, selected professions, and vocational/technical preparation. These opportunities are founded in a strong program of general education and are fulfilled through contemporary disciplinary curricula, certification programs, and vocational/technical education or workforce training. The University assures opportunities in higher education for both traditional and non-traditional students and strives to provide an environment that fosters individual achievement and personal development.	4, 5

3. Provide an analysis of the learning data from your unit. How is this data used as evidence of learning.

The School of Mathematical and Natural Sciences uses performance in the classroom and laboratory to measure student comprehension. Multiple exams are given in each course, and in many courses a comprehensive final exam is given. Homework, quizzes, lab notebooks, field journals, research papers, and oral presentations are also graded in several courses. In the School of Mathematical and Natural Sciences, grades are given almost entirely based on student performance, not attendance and other elements that are unrelated to the student's ability to successfully complete the learning objectives at the course level. The course objectives for each course are based on common syllabi adopted by the state, comparison with courses at other universities, the specific course content required by professional and graduate programs, and for the case of chemistry, the American Chemical Society. Even though our chemistry program is not accredited by the ACS, their internationally recognized model is followed as closely as possible.

Pre-tests and Post-tests

Within the past year, several courses used pre-test and post-tests. The questions asked on the pre-test were very similar to a question asked on the final exam. The questions were chosen over a wide variety of topics. The table below shows pre/post test results for the specific courses that use this method of assessment.

Course	# Students	# Questions	Avg Correct on Pretest	Avg Correct on Final exam
Anatomy and Phys. I	51	15	8.18	10.90
Microbiology	56	7	3.09	5.91
Comparative Anatomy	11	15	4.8	9.7
Introduction to Chem	44	10	4.5	8.9
Intro. to Org. and Biochem Laboratory	3	5	1.3	3.0

The Anatomy and Physiology sections I and II in the Fall 2012 were given a pre-test to measure background knowledge on topics that would be seen in the course. Six of the questions were on topics the student should know prior to entering the course with sufficient background. Similar questions over the same topics were then given on the final exam. The students were not aware they were being assessed in this manner.

In Microbiology, a 15 question pre-test was given to evaluate the students' readiness to enter the course. Seven of the 15 questions were incorporated into the final exam. Two of the seven questions were basic knowledge questions. Students scored well on those two questions on both pre-test and final exam; however, an improvement was seen. Approximately 83% of the students answered question 1 correctly on the pre-test, and all students (100%) were correct on this question on the final exam. On question 2, 78% were correct on the pre-test and 100% correct on the final exam. The remaining questions ranged from 22 -48% correct on the pre-test, with a range of 70-83% correct for those questions on the final exam.

On the first class day of Comparative Anatomy in the Fall 2012 semester, a pre-test was administered. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Comparative Anatomy. The questions were a mix of "big-concept" and detail ideas, and concerned facts that a student who has completed the course would be expected to know, but that wouldn't necessarily be familiar to a student who hasn't had the class. The questions were multiple choice questions with a correct answer and four distractors. On the last day of class, the students were given the same questions. Students at the beginning of the course were not made aware that they would be assessed in this manner.

In Introduction to Chemistry, students were given ten questions related to chemistry and five questions related to basic math skills on the second day of class. For this assessment, the math questions were not included since they did not appear on the final exam in the same format. Since some of the chemistry questions were mathematical in nature, the students were allowed to use their calculator if they remembered to bring it; however, some students did not, which may have lowered the pre-test score slightly. The final exam contained questions over the same topics as the pre-test questions. Some were identical questions, while others were slightly different, but clearly the same topic.

The Introduction to Organic and Biochemistry Lab pre-test consisted of five questions over topics including lab safety, chemical reactions, and calculations. Similar questions were included on the final exam.

Essentially all entering freshmen students are placed into Introduction to Algebra, Intermediate Algebra, or College Algebra or higher based on their performance on the ACT exam, or equivalent placement exam. In accordance with state law, a post-test is given at the end of the Intermediate Algebra course. UAM has selected the ASSET exam as the end of course exam. Almost every student enrolled in Intermediate Algebra scored below a 19 on the ACT, or equivalent on a comparable exam. A 19 is needed to enter college level math courses. A few students with higher than a 19 ACT are in Intermediate Algebra by virtue of failing or withdrawing from College Algebra three times.

In the Fall 2012 term, the ASSET test was given to all Intermediate Algebra sections as a required component of remedial math assessment. 95 of 167 students taking the exam passed at the level equivalent to a 19 ACT score. (Last year 93/143 passed). The trend continues in which several students that essentially walked away from the course came in to take the exam in hopes of scoring the passing score, and therefore qualifying to move to College Algebra or Survey of Math. There were 327 students originally enrolled in all sections of Intermediate Algebra. There were 73 students who passed the course with a grade of C or higher. Of these 73 that passed the course, 53 passed the ASSET exam. These students were allowed to move on to College Algebra by virtue of the course grade. There were 72 students that did not pass with a C or better that still took the ASSET exam, and 42 of these students scored a 39 scaled score or higher, which will allow them to move on to College Algebra or Survey of Math. Overall, 115 of 327 (35%) were allowed to progress to college-level mathematics courses, which is up from 31% last year. This information is summarized in the table on the following page.

In the Spring 2013 term, 216 students took Intermediate Algebra for a grade at the three UAM campuses. 61 students scored a C or higher in the course. Of the 61 students that passed the course, 48 scored equivalent to a 19 Math ACT or higher on the ASSET exam. There were 21 students who scored a D or F in the course that passed the ASSET exam, which will allow them to move on to College Algebra or Survey of Math. Overall, 64% (69 out of the 107) Intermediate Algebra students that took the ASSET as the final exam passed with a score that is equivalent to a 19 ACT. The success rate in this group was similar to that of the Spring 2011 and Spring 2012 classes. Either by passing the course or the ASSET exam, 38% (82/216) were allowed to progress to the general education math course. In 2012, 39 % (95/242) were allowed to move to the next course. Overall, approximately two-thirds of those taking the end of course ASSET exam scored proficient and were allowed to move on to college level math courses. Although UAM has a large number of students withdraw from the course, or are walk away F's, the students who complete the course perform exceptionally well on the nationally recognized exam. When compared to the unofficial results from other universities in the state at the Arkansas Math Chairs meeting, UAM students perform very well. Arkansas Department of Higher Education has not released official numbers reported from all colleges.

Intermediate Algebra 2012-2013

Term	Initial enrollment for three UAM sites	Number Students w/ A, B or C in course	Total Taking ASSET exam	Total Passing ASSET exam	Number Students w/ A, B, or C & Passing ASSET	Number w/ D, F or W & Passing ASSET	Total # Students Progress to College Math
Fall 2012	327	73	167	95	53	42	115
Spring 2013	216	61	107	69	48	21	82

The Intermediate Algebra and Intro to Algebra courses use the ALEKS (Assessment and Learning in Knowledge Spaces) software. The package evaluates students on topics in the course, and indicates level of mastery on each. The software is also used as the online homework tool which gives immediate feedback for those that aren't getting the problems correct. This year, preliminary data was collected; however, different instructors collected different data, so it is impossible to do more than make general observations from what was collected.

ALEKS provides feedback to instructors about initial assessments, final assessments, and reports time used, etc... For the Intermediate Algebra students that took the ASSET exam, taking the course on the Monticello campus only, the average number of topics completed on the initial assessment is approximately 10%. By the end of the course the students averaged completion of 54% of the topics. There is a small correlation between the number of topics completed and the ASSET score, but it appears that the number of topics completed, and overall time spent, is more closely linked to overall course grade and final exam grade. When reviewing preliminary data for the Intro to Algebra course, it appears that very few students that spent less than 30 hours during the semester on ALEKS passed the course; while the students that put in greater than 60 hours during the term typically score an A or a B. There are a few exceptions; however, there is certainly enough correlation to continue collecting data in the future for analysis. The data collected is not complete, and different instructors provided different information. There are plans to collect the proper data for all sections, and run a proper statistical analysis.

Performance on National Exams

Students completing both General Chemistry and Organic Chemistry are given nationally normed American Chemical Society (ACS) Examinations as final examinations. Scores on these exams indicate that our students are continuing to perform near the national average in General Chemistry, and above that in Organic Chemistry. On this year's General Chemistry standardized final exam, UAM students finished two questions below national average. Although it is below national average, we are fairly pleased with our results since we are being compared to ACS certified programs, and several that use the exam are prestigious private institutions. Many of the institutions that use this exam are larger universities that have separate courses for majors and non-majors. Some institutions use the standardized final only in their course intended for chemistry majors. This year's Organic Chemistry class' mean and median scores were exactly the national average, with several students scoring above the 80th percentile nationally. The Biochemistry II course also used the American

Chemical Society exam for the first time; however, there are no national statistics to compare to at this time. Those statistics will become available in 2014. The item analysis from the final exams are reviewed periodically to identify trends on the most commonly missed questions. The individual faculty member uses this information to improve coverage in certain areas. In recent years, the laboratory exercises have been changed slightly to provide additional coverage for areas that were identified as a problem area on the ACS Final Exam.

When examining item analysis for the exams, there are no clear trends on what topics are missed most on the exam. Slightly more students miss questions on multi-step organic synthesis than the other questions, but this is expected since these questions are more difficult and require far more critical thinking skills than the questions related to nomenclature or physical properties of organic compounds. Although we are proud of UAM's performance on this exam, we need to use this information appropriately since we typically have only 12-15 students completing the Organic Chem II course, even though we may start with 30-36 students at the beginning of Organic Chem I. We are looking at the best students of a very small group that have already successfully completed Gen Chem I and II and are typically good students as a whole, but this should be the case at all universities. When examining the rosters from the past, it is not uncommon to find that the students that perform well on the ACS final exams are typically those accepted into medical school, pharmacy school, or other professional or graduate programs.

In General Chemistry, the ACS final exam scores have declined over the past several years. Since 2008, the scores have been in the 40th to 45th percentile range, nationally. This year, the class averaged 41st percentile. The decline in the test scores over the past few years is partially attributed to the decline in the number of chemistry majors in these courses. Only one traditional chemistry major has graduated in the past four years. The bulk of the students taking the General Chem I and II sequence are biology majors and agriculture majors. The chemistry faculty have recognized that students are not putting the effort into the homework. We have reviewed several on-line homework packages and have tried some of the packages on a trial basis. It is likely that one of these packages will be adopted in the future that will allow students to do homework on-line and get immediate feedback. In the past year, the Sapling Software package was used for online homework and assessment. It was chosen because of the low cost to the students, and also their policy that allows course repeaters to continue using the software at no charge. While some students enjoyed the immediate feedback when doing homework, many did not like the online home compared to the pencil and paper version because they felt it takes longer to do the online homework because of the formatting of answers and just navigating throughout the files. Other packages will continue to be reviewed with more emphasis being put on having a user friendly interface. The general chemistry faculty also plan to look into other textbook options for the course, some of which will include their own supplemental software packages at lower cost.

Admissions Exams

Since many School of Mathematical and Natural Sciences students are seeking admission into medical, dental, or pharmacy school, we often use those exams as a measure of program quality.

During the past year, one student took the Medical College Admissions Test (MCAT) and self-reporting scores back to UAM. The exam has sections in biological sciences, physical sciences, and verbal. Each section is worth a possible 15 points each. There is also a writing sample which is ranked on a letter scale from K to T

with T being the best and a score with O being national average. The composite scores for the student was a 28 out of 45, which ranks just above 60th percentile, nationally. As in the past few years, UAM students typically score lower in both the verbal and writing sections, and average or above in both biological and physical sciences; however, this can vary greatly from student to student. This student, along with the student who scored a composite 39 last year, was accepted into medical school; however, this student has declined his position and has accepted a graduate assistantship at the University of Memphis to study neurobiology. UAM's last twenty consecutive medical school applicants have been accepted into medical school, or have pulled their application prior to the deadline due to being accepted into another program, which was the case last year when a student withdrew his medical school application after being accepted into dental school. The MCAT scores, and a table for national comparison, are shown in Appendix A.

Fourteen students took the PCAT exam in the past year with scores ranging from 25 to 81 on a 100 point scale. The exam has sub-scores for verbal, biology, reading comprehension, quantitative ability, and chemistry. There is also a writing score based on a 5 point scale. There is also no calculator allowed on this exam even though calculations are done in both the quantitative and chemistry sections. Typically, UAM students score highest in chemistry or biology sections of the exams. For most UAM students, the verbal and reading comprehension scores typically are lower. Students who are lifelong readers typically perform well. Students who are not lifelong readers score poorly, and very little can be done in the short term to improve this score. As in the past several of our students didn't perform well on the quantitative section of the exam; however 3 of the ten self-reported sub-scores for UAM students scored greater than the 60th percentile on this section.

Each year, one or more of the pre-pharmacy advisors attends the UAMS Pharmacy Advisors Meeting. The official meeting is very general in nature, but more importantly, faculty at the pharmacy school often interact with advisors one-on-one to discuss strengths and weaknesses in the students coming from the 4-year institutions. A UAMS faculty member that was one of Dr. Bramlett's former students told him that UAM's students did quite well. One UAM student scored near the top of the class on the organic chemistry evaluation exam that is given early in the term. They are very pleased with the overall science background of the UAM students. This year's applicant group from UAM was quite large, with 15 applying to various schools, with 13 receiving letters of acceptance. A 14th applicant would likely have been accepted had they not made two D's in the fall term (severe personal issues). Several of the students were accepted to more than one college of pharmacy.

Three students took the Dental Aptitude Test (DAT) in the past year. All three scored above national average on the exam. One student is applying to several dental schools for the 2014 entering class. One student was accepted into the 2013 entering class at the University of Louisville. The other applicant was not accepted despite having a decent DAT score and acceptable GPA. This student is applying again for the upcoming year as the resident of another state, which should greatly enhance his chances of being accepted. The lack of an in-state dental school makes it very hard to be admitted into dental school since there are only a limited number of positions held for Arkansas students.

Two Math and Science students have reported GRE examination scores in the past twelve months. GRE has adopted a new scoring system which makes it very difficult to compare current scores to those in the past. One

of the student's score was outstanding. The other was slightly above national average. See Appendix A for scores.

Capstone Courses

Biology, chemistry, and mathematics all have a capstone course requirement. Respectively these courses are BIOL 4741, Biology Seminar; CHEM 4611, Chemistry Seminar, or CHEM 4691, Senior Research, or CHEM 4742, Advanced Laboratory Techniques; and MATH 4711, Mathematics Seminar. Students research a topic, utilizing information from both the library and their own class and laboratory experiences. The students must write a research paper and do an oral presentation, either locally or at a professional meeting. The Biology faculty grade all students in Biology Seminar. All chemistry faculty are involved in the grading of the papers and oral presentations in Advanced Lab Techniques.

This year, nine students participated in the Advanced Laboratory Techniques. Five of the students did an exceptional job on their papers and presentations. Two were ranked very good, and one was average. The lowest ranked student was asked to repeat his oral presentation. It was much improved on the second attempt. The faculty felt that all students had met the learning objectives.

Three students involved in chemistry research did presentations at professional meetings. In each case, the students' preparation of the research poster or oral presentation was very good. Two students did similar presentations at multiple meetings. All demonstrated successful accomplishment of student learning outcomes.

Name	Meeting	Title
Taylor Snider	NASA-Arkansas Space Grant Consortium Annual Symposium NASA Research Labs, Cape Canaveral, FL Posters at the Capitol	Method Preparation of Determining Fatty Acid Content in Native Arkansas Algae
John Austin Beatty	INBRE 2012 Conference, Springdale, AR Posters at the Capitol	Regeneration of Resin Beads for Commercial Use in Biofuel Cleaning
Esgar Jimenez	Posters at the Capitol	Formation of Hydrogen Gas by Electrochemical Methods for use as a "Green" Fuel Source

In Mathematics, six students took the capstone course, Mathematics Seminar in the past year. The students in the course must write a research paper and perform an oral presentation, demonstrating knowledge and understanding in a specific area of mathematics. This group was very strong compared to past years, and all students performed very well and easily met the desired learning outcomes.

Biology Seminar is used as the capstone course for the Biology major. Thirteen students completed the course in the 2012-2013 academic year. Ten of the students did an excellent job finding related references, writing the paper, and presenting the information in the seminar. All students had to do minor re-writes on the paper to get

the appropriate references and follow the proper format. One student struggled, having to do major re-writes, and finally dropped the course. Twelve of the thirteen students met the course learning objectives at well above the acceptable level.

Ten biology majors were involved with research projects that ended with the presentation of their results at professional meetings. Some of the presentations were oral presentations made by an individual while others were poster presentations involving several students. The biology faculty felt that all students displayed very good to excellent knowledge of the topics and performed exceptionally well in preparing the poster or digital presentation. The presentations are listed below:

Name	Meeting	Title
Shana Chancellor	Posters at the Capitol	Function of Two Genes in Growth and Tumors
John “Bo” Kelley	Arkansas Academy of Science Posters at the Capitol	Searching for Beetles Associated with the Dung of Native Arkansas Mammals
Ryan Reyes	Arizona 11 th Annual Student Research Conference, Tempe, AZ	Evidence of Hybridization Between Two Taxa of the Genus Cardamine
M. Collins N. Jones M. Lindsey C. Roberts J. Garmon	ARK-LSAMP Spring Research Conference	Evaluation of the DNA Sequences from the Nuclear Large Subunit Ribosomal RNA gene for Use in Delimiting Species of Algae Nannochloropsis.
Kiara Newhouse Drew Prescott	ARK-LSAMP Spring Research Conference	The Digitization of the UAM Herbarium: Bringing Analog Data into the Digital Age

Even though our physics program has only a minor and primarily serves as support courses for mathematics, chemistry and biology, there were four students involved with undergraduate research projects. All of the students exhibited excellent knowledge of the research topics. Two of the students presented their research at regional meetings. Both did an excellent job of organizing material and developing the displays for their poster presentation. Those presenting were:

Name	Meeting	Title
Anabel DeLaCruz	INBRE 2012 Conference, Springdale, AR	Dynamics of a System of N-Coupled Sawtooth Maps under Different Coupling Schemes
Chris Gillison	NASA-Arkansas Space Grant Consortium Annual Symposium	Dynamics of N-Coupled Two Dimensional Maps

Overall, the School of Math and Sciences had numerous research projects involving students. From these

projects there have been 14 professional presentations by students, 3 publications in refereed journals, and 15 grants that had contributions from student researchers. These students are recognized for being excellent students and are highly sought after for graduate programs. Four of the biology students were accepted into Ph.D. programs. One of the four received the Distinguished Doctoral Fellowship based on grade point average and performance on the GRE exam.

Three Mathematics graduates have been accepted into the M.S. in Mathematics program at the University of Central Arkansas.

4. Based on your analysis of student learning data in Question 3, include an explanation of what seems to be improving student learning and what should be revised.

Over the past two years, the remedial mathematics courses have adopted UAM written text/workbooks that provide less theory and are more of a “how to” guide. Each book is coordinated with the ALEKS (Assessment and Learning in Knowledge Spaces) software which provide assessments, homework, practice problems, and pre-test assessments. The course pass rates have not increased significantly with the adoption of this approach; however, several students are passing the end of course exam, even though they are not passing the course. This is partly due to the faculty having multiple tutoring sessions with practice ASSET exams. When combining the number of students that pass the course and the number of students passing the end of course exam, the overall success rate in intermediate algebra for students being allowed to proceed to college level math is approximately 40% of those initially enrolled. Prior to the implementation of ALEKS and the workbooks, the success rate in Intermediate Algebra was approximately 25%. Although the current 40% success rate represents a small increase, we are not proud of the fact that 60% of the initial enrollees are not successful. We feel that a large part of this is due to lack of student effort. In many cases, this has been shown by the amount of time spent on the ALEKS program. The ALEKS program logs the amount of time that work is done for each student, and it is clear that the bulk of the students that are unsuccessful have put in very little or no time. On the other hand, students that have put in the recommended number of hours typically do better in the course. Faculty in both Introduction to Algebra and Intermediate Algebra have indicated a strong correlation between hours logged and overall grade in the course. The exceptions to the previous statement are typically non-traditional students that struggle in mathematics. Many of the students that receive an F in the course come to class occasionally, log very little time on ALEKS, and simply quit coming to class at some point in the semester. Plans were in place to do a test course in which a required component of the Intro to Algebra course was a mandatory two hour lab per week. The course was dropped from the fall 2013 schedule after only one student had enrolled in the course by mid-July.

Introduction to Algebra went through similar changes with an in-house written text, and coupling with ALEKS. Ms. Victoria Ryburn developed the text and worked closely with the advisors from ALEKS to put together a package suitable for UAM students. The package is far cheaper than the previous textbook, and like Intermediate Algebra, the students can do on-line homework and practice for exams. It’s built in assessment lets the students know which topics they have mastered. Results similar to those found in Intermediate Algebra have been found, with those putting in more time being far more successful than those that are putting less or no time. In Introduction to Algebra there isn’t a nationally normed end of course examination as there is in

Intermediate Algebra; however, a team written comprehensive final examination is given. Typically about 40% of the students that complete the course (i.e. take the final) pass with a grade of C or higher. Based on number of students who start the term, the success rate is typically around 20% passing with a C or higher. This year was no different. The success rate for the Fall 2012 term was 20.9%. We are in the third year of using this workbook and software package. We have not seen an increase during this past year; however, we are continuing to make improvements on the text and the software. The addition of two new faculty will likely cause changes to occur in this course. There are hopes that an infusion of new ideas and personalities will create positive changes in this area.

The math faculty teaching developmental courses meet regularly, and have ongoing discussions about how things should be covered in their courses. Everyone follows a pacing guide that is agreed upon at the start of the term. The creates a need to alter some topic coverage in order to get all the topics seen by the end of course ASSET exam. This requires changes in workbooks and the ALEKS package to match the coverage.

The faculty teaching the Survey of Math courses last year adopted an online homework system which provides immediate feedback. They used My Math Lab on a trial basis in hopes that the students work more practice problems prior to the exams. Some students, especially those that were trained on ALEKS, accepted the software rather easily. Others resisted strongly. Other packages are still being considered.

The General Chemistry I and II sequence is very difficult to make improvements on because of the broad background of students taking that course. It would be beneficial to everyone if we could separate the courses into courses for science majors and non-science majors, but the number of students that we are dealing with is so small it is impossible to make this change without causing major disruption to several units on campus. Since the ACS standardized final is often given to majors only courses at other universities, we actually compare fairly well. Our chemistry majors, and many of our biology majors, typically score above the national average on that exam; however, we typically have only 1 or 2 majors per class. Discussions are being held about how to diminish the gap between General Chemistry I and General Chemistry II. The level of difficulty in Chemistry I is fairly low compared to the mathematical concepts covered in Chemistry II. We are discussing the possibility of moving one or more topics from Chemistry II into Chemistry I, which would give more time for students to grasp the topics in Chemistry II.

Relatively few changes are made to our courses or programs based on performance on the professional exams such as the PCAT or MCAT exam. The scores on those exams are affected by many variables other than course content knowledge. Some of these factors are: reading speed and comprehension, tendency to do well on standardized exams, and the amount of review time spent on each subject before the exam. The faculty and staff at UAMS do tell us that students that complete our programs perform well in their programs. They also indicate that students that take equivalent courses at less rigorous institutions typically do not do as well in their programs. We are looking at the calculus content on the PCAT exam since our students have not done well on the quantitative portion of the PCAT over the past several years.

In the capstone courses there are changes made periodically. Typically, the instructor of record for the course has the final say on changes being made; however, this course is team taught by all faculty in chemistry, and informal discussions are held every fall to determine what is going to be done in the spring offered course.

While some changes are made to suit the instructor for that particular term, other changes have been assessment driven. For instance, the year after Advanced Laboratory Techniques was implemented, the Chemistry faculty felt that not enough emphasis was placed on the research paper, and too much emphasis was placed on the specialty techniques being taught. We changed the emphasis to be much higher on the written paper and seminar, and since that time, there has been a major improvement on the performance in those areas. Last year, the student output was very good for the most part. This year, the students continue to improve on the writing portion. The students are still exposed to specialty lab techniques and instrumentation that they are likely to see in graduate school or in the workplace; however, we are not covering that material at the same depth as before. This year's topic (Food Chemistry) was chosen to heighten the interest in the agricultural and food industries in the region.

Students are very much encouraged to present their research findings at regional and national meetings. Students who take part in scholarly activities other than normal course work have a much deeper understanding of the topics covered in the classroom. We have made more funding available for student travel so that more students can participate in professional meetings. Five years ago, we rarely had students presenting at meetings. The past two years we have had approximately 15 students involved with one or more presentations.

5. Other than course level/grades, describe/analyze other data and other sources of data whose results assist your unit to improve student learning.

The School of Mathematical and Natural Sciences uses a variety of other measures to assess the quality of our programs. These measures include job/graduate school initial placement, senior exit surveys, alumni surveys, and student evaluations. We rarely get information back from employers; however, we attend annual meetings with professional programs. Their faculty and administrators verbally provide very general information about trends they see among the students coming from our institution. This information is intentionally very general in order to not violate FERPA laws.

When reviewing the Math and Science graduates over the last several years, many of the students have been very successful in their initial placement. Several students have attended graduate school or a professional school, others have found positions in industry, while others, especially in mathematics, have chosen to enter the field of education. Every medical school applicant from UAM over the last ten years has been accepted. The pharmacy acceptance rate is near 75% during that same period of time; however, we feel that every applicant that has truly deserved to be admitted has been. Applicants to dental school programs have been slightly less successful, at 50%, mainly due to the fact that our students must apply to out of state programs. See Appendix B for initial placement information of Math and Science graduates from the current year.

Most graduating seniors take part in exit interviews with the Dean of Math and Sciences. This year, additional questions were asked about the specific courses in their curriculum. Most students had little or nothing to say specifically about the curriculum. Two Biology majors felt that Genetics and Cell Biology should be taught in the opposite order based on the depth of some of the topics covered in those classes. At one point, Cell Biology was taught in the fall with Genetics in the Spring; however, the current instructor feels that some Cell Biology topics would have to be taught differently if the student didn't have the background information from Genetics. Even though it isn't recommended, occasionally we have allowed students take the courses out of sequence in

order to complete graduation requirements in a timely fashion. One Math major felt strongly that we should add an Engineering program. Lack of funding, no space, and low enrollments would all be difficult to overcome with the addition of a program of this type; however, it is a program that I wish had been added in the 1960's when money was available to start programs of this type. Most students praised the education they have received in the sciences. One student made the comment, "I came to UAM for athletics, but I stayed because of the preparation I was getting for pharmacy school." This student was accepted at 4 different pharmacy schools, and has chosen to attend the University of Texas College of Pharmacy, which is ranked by *U.S. News and World Report* to be a top 4 program. It is clear from the exit discussions that students believe that UAM is largely successful because of the faculty and staff that are employed here. Students openly praise the faculty for their knowledge and level of commitment to helping students, but many students feel that we are behind other universities that they have visited in terms of equipment and facilities. One student mentioned that it was embarrassing to see signs for events on campus posted on T-posts, like those used on a farm fence. Another mentioned a visit from his parents early in his career in which his mother pointed out the mold growing outside the Science Center. See Appendix C for a list of typical questions asked.

Alumni surveys were once sent out with newsletters mailings, but the newsletter has not been sent out in several years due to time required to put it all together and mailing costs. Often, when students reconnect with the School of Math and Sciences, an Alumni Survey is sent out via email. A fairly small percentage of these are returned, and those that are returned generally mirror the results of the exit surveys. Comments are very positive for the most part. For copies of recent graduate surveys received, see Appendix D.

Even though it is more informal, we do listen to current student comments. We do a lot of individualized advising in Math and Sciences because so many of our students are applying to specific programs out-of-state and therefore have slightly different prerequisites. Often students come to us with problems caused by poor advising from another unit where a student was wrongly assigned, or started as a general studies student. While most of these problems were created based on information that the students provided on an application, we could still do a better job by catching those mistakes early. The most common mistakes that we see are students that are planning on attending medical school, pharmacy school, or an allied health program being put into the wrong biology, wrong chemistry, or not put into these classes at all. This essentially puts the student a year behind. Since students can apply to these programs from any major, it is important that they be listed in WeevilNet as pre-med and as their major.

We try to monitor the progress of our graduates by staying in contact directly with the students, and also by contact with faculty in their professional programs. The Pre-Med Advisors Meeting held at UAMS every spring gives us general information about the performance of our students, but information about individual students is kept confidential. This year, they mentioned that the UAM students were performing quite well, with one student being in the top ten of the class. The UAMS and Harding University Colleges of Pharmacy each provide similar information about our students. Harding reported that one of our students had made the Dean's List. UAMS representatives said that all the UAM students were doing fine in their coursework.

At professional meetings, our faculty members often meet faculty from graduate programs that have accepted our students. Again, we cannot get specific information about a student, but we do get generalized information about what we can do to improve our programs. A specific recommendation that was recently expressed by a

faculty member from the chemistry program at University of Arkansas was that we implement more assignments in which our chemistry majors use chemical literature. In response to that recommendation we have put more emphasis on the research paper portion of Advanced Lab Techniques. We are also encouraging all majors to take part in undergraduate research projects, which will involve more contact with the chemical literature and also scientific writing. In the Master of Arts in Teaching (MAT) program, they want the students more exposed to educational settings, and possibly introduce some pedagogy into their curriculum. In response to that request, the School of Math and Sciences recommended the development of the minor in Teaching and Learning. We are encouraging this minor for all majors that are considering a career in education. Although we have had no Math and Science majors choose this as a minor, we have had several students take courses from the this minor as electives. Several of the students have indicated that they feel this better prepares them for the MAT program.

6. As a result of the review of your student learning data in previous questions, explain what efforts your unit will make to improve student learning over the next assessment period. Be specific indicating when, how often, and by whom these improvements will take place.

Last year, we tried to put more emphasis on structure, polarity, and physical properties of organic compounds in both our General Chemistry and Organic Chemistry. The implementation of this improvement will continue in the upcoming year. Last year, a new text that was chosen for organic chemistry that provides more detail in this area; however, after using that text for one year, a decision was made to go back to the previous textbook. It was a better fit of our most common audience, Biochemistry and Biology majors.

Many of the advisors, especially in the pre-professional and allied health programs, are planning group advising sessions. We did a small amount of this in 2012-13, but plan to do even more in the upcoming year. Currently, they are planned for the Tuesday or Thursday activity hour (12:30-1:30). The idea is to provide better information on what is needed to be accepted into the professional programs. Hopefully, it will help students make an earlier decision on their career choice, and provide an avenue for early intervention for students that are struggling. Admissions representatives from the UAM Master of Arts in Teaching program, UAMS College of Medicine, William Carey College of Osteopathic Medicine, UAMS College of Pharmacy, and Harding University College of Pharmacy each provided a program for our students.

During faculty development week meetings, assessment will be discussed in each discipline's meeting. With the implementation of the new student evaluation system, we are trying to develop some assessment driven questions that will be added to the specific course evaluations. Implementation of other assessment tools, such as pre-test/post-test, will be considered.

7. What new tactics to improve student learning has your unit considered, experimented with, researched, reviewed or put into practice over the past year.

Upgrades to the newly implemented Introduction to Algebra workbook/text and ALEKS software are currently being done. Dr. Hassan Sayyar continues to make improvements to the College Algebra workbook. Calculus

I, and Calculus II tried the WebAssign online homework system on a free trial basis last year. Some students enjoyed the immediate feedback the software provided. Other students were less receptive to online homework. Some of the Math faculty are considering e-books as a way to save costs. The faculty are planning to meet with the University of Central Arkansas mathematics faculty to discuss the possibility of contributing to statewide written textbooks which would be far cheaper than the current textbooks used in those courses.

Some courses in mathematics would like to use the computer lab during class on occasion to give hands-on practice on the online homework and assessment packages. Currently, with only ten computers, the facility is too small to be able to do this effectively. Requests have been made that will put 5-6 more resurrected computers into the lab, which will make it possible for an entire class of students to work in the lab when working as pairs.

In chemistry, work continues on developing electronic lectures that the students can watch on their own time, which would allow class time to be used more for problem solving and critical thinking activities. At this time, the technology that will be used is probably going to be voice-over Powerpoint (VOP). A few VOPs were done in chemistry labs in the past year, and were fairly well received by the students. Lynn Fox used VOPs extensively to provide additional study opportunities for her students in mathematics. We purchased a “pen” that could be used to write digital information to the computer screen and record her voice as she explained the material being covered. This was very useful in making lecture content available outside of class. A *Bamboo* electronic interface was also purchased for use in developing the VOP’s for chemistry.

A decision was made to install projectors and computers in the labs where dissections are commonly being done. Nothing was done in the past year on this project because we are waiting for the building to be fitted with wireless technology. Supposedly we should have that in place this fall; however, no work has been done in that area at this time.

At the urging of the Provost, we are planning to develop an online Introduction to Chemistry course and an online College Algebra course for Fall 2014. These will most likely be hybrid courses. Even though most of the faculty in Math and Sciences feel that online classes are much lower in quality than face to face courses, some are considering the possibility of hybrid courses. By being a hybrid, we feel that we can maintain standards and provide the all important hands on component. We attempted to offer the first hybrid mathematics course in the Fall 2012 term; however, after the last registration period was complete, only one student had enrolled in the course. Many students called about the course, but most did not want to take it when they learned that exams were going to be held in class. One student even made the comment that he didn’t mind coming to class, he just wanted the exams to be online.

Several faculty in Math and Sciences are using the first day of class each semester as a chance to talk with students about careers and what courses they need to be in. So far, this has been a positive event in which several students have changed courses in order to be in the proper course for their major.

8. How do you ensure shared responsibility for student learning and assessment among students, faculty, and other stakeholders?

Students are continually given feedback on their progress throughout each course by posting of grades on exams, quizzes, homework, lab assignments and other assignments. Students meet with advisors at least once per term, and more realistically, several times per term. The students provide feedback to the unit in the form

of student evaluations. The online student evaluations provide data comparison and student comments to the dean and faculty member. Many students meet with Dean Bramlett to discuss classes, progress toward a degree, committee references for those applying to professional school, and often just to informally chat. All graduating seniors are given an invitation to meet with Dr. Bramlett for an exit interview to discuss their experience within the School of Math and Sciences. See Appendix C.

Faculty are encouraged to maintain good communication with their students and properly post up to date grades. At the encouragement of the dean, several faculty now pass out mid-term grade sheets to students in the lower level classes. This has been a huge success within the School. The faculty are also involved with collection of data and reporting to the appropriate representative on the Math and Science Assessment Committee. This information consists of grades and other feedback related to student performance in the classroom, scores from standardized national exams in general and organic chemistry, scores from ASSET end of course examinations in Intermediate Algebra, and data collected relative to capstone courses in each major.

9. Describe and provide evidence of efforts your unit is making to recruit/retain/graduate students in your unit at the University.

We have certainly become more active in recruiting students over the past few years. Last year, Dr. Bramlett provided instruction at three Advanced Placement test preparation workshops. One hosted in Monticello in December 2012, one hosted in El Dorado in January 2013, and one in Arkadelphia in May 2013. At each site, 5 hours of instruction were provided over 2-4 different topics. At the December workshop, the topics covered were stoichiometry, electrolytic cells, galvanic cells, and net ionic equations. The topics at the January session were kinetics and thermodynamics. At Arkadelphia buffer solutions, nuclear chemistry, and atomic structure were covered. He also taught kinetics for the AP Chemistry class for two days at Star City High School. At each event, a few minutes were taken to recruit students into programs at UAM. Although classes have not started yet, I have been told by two students from Star City's AP Chemistry class that they are planning to attend UAM. I know one student from Sheridan High School that was attending the Arkadelphia workshop has indicated that she is coming to UAM. In the past, the guest teaching appearances have seemed to work well in attracting students into the Math and Science majors. Several students from Hamburg attended UAM from the AP Chemistry class that Dr. Bramlett worked with in 2009-10. Students from other high schools with which he has worked are also attending UAM at this time, including students from AP Chemistry classes at Rison, Crossett, and Star City.

In addition to the classroom visits, the School of Mathematical and Natural Sciences and the Education Renewal Zone hosted four days of Advanced Placement test prep in which 90 -160 students attended each day. We also hosted the Regional Mathematics Contest and the Regional Science Fair. Science Fair information can be found at http://www.uamont.edu/math_and_sciences/RSE/. At these events, faculty and representatives from Admissions were given the opportunity to meet with students and discuss the potential to attend college at UAM.

To retain students, the faculty in Math and Sciences are giving freshmen special attention during academic advising and also in the first day of freshmen level classes. They are given very specific information on expectations in each course, and also for each major or pre-professional curriculum, such as curriculum guides. These are available on the UAM webpage at: http://www.uamont.edu/Math_and_Sciences/academics.htm Curriculum guides for the specific majors can be found in the UAM Catalog. Scholarships are also provided by the School of Mathematical and Natural Sciences. In the upcoming year, \$10,820 will be awarded to

We also use the Biology Club, the Medical Science Club, and the Math and Physics Club as social hooks for students. Getting involved in these clubs gives them more of a purpose to be here other than just attending classes. It also gives them a glimpse of the future that a degree in the Math and Sciences areas can provide. These clubs bring in speakers from other universities and from industry. They do community service projects, such as highway clean-up, Saline River stream team clean-up events, and Relay for Life. They have social events such as football tailgating and cookouts.

The overall goal of the School of Mathematical and Natural Sciences is to produce successful students, which in most cases implies graduating with a degree; however, it is ironic that the most successful students often gain admission to a professional school prior to completing their degree. We do allow courses to transfer back for degree completion purposes within the guidelines set by the University (see page 60, 2013-15 UAM Catalog); however, especially in allied health programs, those students do not have enough hours to qualify. Those students are encouraged to complete the associates degree, but many do not choose to take the specific remaining courses to do so.

In most of the Math and Science majors, there are a fairly large number of students who change their major, often to majors in other units, after their first semester or first year. The rigors of chemistry, biology, math and physics often are greater than the student expected. Many people enter UAM with an interest in pharmacy or medicine, but after one or two courses decide that their skill level isn't adequate for those pursuits. Those students are often encouraged to change their major to something else. When these students change majors, this is not necessarily a retention problem since they are likely to graduate in another major; however, since we do not attempt to track these students, our numbers of graduates relative to the numbers of majors does not look good. For numbers of majors and numbers of graduates over the past several years, see Appendix E. After the freshmen year fall-off, a fairly large percentage of the students do graduate and are successful in industry, a graduate program, or in the field of education. For a list of initial placement of our graduates from the current year, see Appendix B.

Letters and emails have been sent to several students that have completed a significant portion of their degree and then dropped out. Options are reviewed to see if prior biology and chemistry majors are closer to a Natural Science or the Bachelor of General Studies degree. One drop out that I assisted last year plans to return to campus this fall to complete his degree. See Appendix F for a copy of a letter sent to a student. In the past year, several students have been contacted about the possibility of completing their degree through the Bachelor of General Studies major, or using the professional school courses to complete their degree. At this point, approximately ten students have been awarded degrees. Several others are in the process of sending transcripts and filing the appropriate paperwork for completion. An email is shown in Appendix F.

**Appendices for the
Annual Assessment Report
2012-2013**

School of Mathematical and Natural Sciences

- Appendix A Nationally Scored Exam Results
PCAT, MCAT, and DAT Scores
- Appendix B Initial Placement Information
- Appendix C Exit Survey Questions
- Appendix D Returned Alumni Surveys
- Appendix E Number of Majors/Graduates
- Appendix F Reconnect Letter to Student

Appendix A

Nationally Scored Exam Results

PCAT Scores

MCAT Scores

DAT Scores

GRE Scores

PCAT Exam Scores

Student A	Test Date September 2012	The Psychological Corporation
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Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	395	38
Biology	408	57
Reading Comprehension	398	47
Quantitative Ability	393	33
Chemistry	395	39
Composite	398	40

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to University of Louisiana –Monroe and UAMS Colleges of Pharmacy

Student B	Test Date July 2011	The Psychological Corporation
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Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	419	78
Biology	411	63
Reading Comprehension	395	41
Quantitative Ability	387	21
Chemistry	392	34
Composite	401	47

Writing Scores	Your Score	Avg Score
Conventional Language	3.0	2.76
Problem Solving	3.5	2.76

This student has been accepted to University of Tennessee-Memphis and UAMS Colleges of Pharmacy

Student C Test Date November 2012 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
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Verbal Ability		
Biology		
Reading Comprehension		
Quantitative Ability		
Chemistry		
Composite	400	45

Writing Scores	Your Score	Avg Score
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Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to UAMS College of Pharmacy.

Student D Test Date September 2012 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
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Verbal Ability	398	43
Biology	408	57
Reading Comprehension	402	54
Quantitative Ability	396	39
Chemistry	408	61
Composite	402	50

Writing Scores	Your Score	Avg Score
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Conventional Language	3.0	2.76
Problem Solving	3.0	2.76

This student was accepted to UAMS and Harding University Colleges of Pharmacy.

Student E Test Date November 2012 The Psychological Corporation

Multiple Choice Scores Scaled Score Percentile Rank

Verbal Ability		
Biology		
Reading Comprehension		
Quantitative Ability		
Chemistry		
Composite	390	25

Writing Scores Your Score Avg Score

Conventional Language	Unreported	
Problem Solving	Unreported	

This student has been accepted to Harding University and University of Tennessee-Memphis Colleges of Pharmacy

Student F Test Date November 2012 The Psychological Corporation

Multiple Choice Scores Scaled Score Percentile Rank

Verbal Ability	416	74
Biology	411	63
Reading Comprehension	421	86
Quantitative Ability	417	78
Chemistry	418	76
Composite	417	81

Writing Scores Your Score Avg Score

Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to Harding University and UAMS Colleges of Pharmacy.

Student G

Test Date September 2012

The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
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Verbal Ability	401	49
Biology	434	91
Reading Comprehension	396	43
Quantitative Ability	413	72
Chemistry	408	61
Composite	410	68

Writing Scores	Your Score	Avg Score
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Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to UAMS, Harding University, University of Houston, and University of Texas Colleges of Pharmacy.

Student H

Test Date July 2012

The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
------------------------	--------------	-----------------

Verbal Ability	412	68
Biology	411	63
Reading Comprehension	402	54
Quantitative Ability	402	51
Chemistry	418	76
Composite	409	66

Writing Scores	Your Score	Avg Score
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Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to Harding University and UAMS Colleges of Pharmacy.

Student I Test Date September 2012 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	406	58
Biology	411	63
Reading Comprehension	436	97
Quantitative Ability	426	88
Chemistry	408	61
Composite	417	81

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to UAMS College of Pharmacy.

Student J Test Date November 2012 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability		
Biology		
Reading Comprehension		
Quantitative Ability		
Chemistry		
Composite	414	76

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to UAMS College of Pharmacy.

Student K Test Date January 2013 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	409	63
Biology	399	40
Reading Comprehension	431	94
Quantitative Ability	384	16
Chemistry	379	14
Composite	400	45

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	
Problem Solving	Unreported	

This student was accepted to Harding University College of Pharmacy.

Student L Test Date January 2013 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	409	63
Biology	399	40
Reading Comprehension	406	62
Quantitative Ability	387	21
Chemistry	399	45
Composite	399	43

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	
Problem Solving	Unreported	

This student was an alternate at UAMS College of Pharmacy but was not admitted

Student M

Test Date January 2013

The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	432	91
Biology	402	46
Reading Comprehension	406	62
Quantitative Ability	390	27
Chemistry	439	93
Composite	414	76

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	
Problem Solving	Unreported	

This student did not apply to any pharmacy schools, but will apply for 2014.

MCAT Test Scores

Student A

Test Date	July 2012	Score	Percentile
	Verbal Reasoning	8	40.2-55.0
	Physical Sciences	9	53.6-66.1
	Writing Sample	M	10.9-32.5
	Biological Sciences	11	76.0-88.1
	Total Score	28-M	62.2-68.0

This student was accepted into the UAMS College of Medicine, but has declined the offer in order to accept an assistantship at the University of Memphis to pursue a Ph.D. in Neurobiology.

DAT Test Scores

Note: Standard Scores used in the testing program range from 1 to 30. Only standard scores are reported to dental schools.

Academic Average is the average of the five scores rounded to the nearest whole number, QR, RC, B, GC, OC

Total Science score is a standard score based on all 100 questions in Biology, General Chemistry, and Organic Chemistry
It is not the average of the three science standard cores.

Student A

November 2012 Test Date

	Score	Percentile
Perceptual Ability	23	96
Quant. Reasoning	16	64
Reading Comp.	20	64
Biology	18	64
Gen Chemistry	18	62
Org Chemistry	16	39
Total Science	17	49
Academic Avg	18	63

This student was not admitted for 2013 entering class

Student B

August 2012 Test Date

	Score	Percentile
Perceptual Ability	25	99
Quant. Reasoning	17	64
Reading Comp.	22	84
Biology	17	49
Gen Chemistry	18	62
Org Chemistry	18	60
Total Science	18	63
Academic Avg	19	78

This student was accepted at the University of Tennessee and University of Louisville Dental Schools.

Student C

June 2013 Test Date

	Score	Percentile
Perceptual Ability		
Quant. Reasoning		
Reading Comp.		
Biology		
Gen Chemistry		
Org Chemistry		
Total Science		
Academic Avg	21	89

This student has not applied to dental school.

GRE Scores

Student A December 2012

	Raw Score	Percentile
Verbal	162	90
Quantitative	160	84

This student has been accepted into Ph.D. program in biology at Auburn University, awaiting assistantship

Student B March 2013

	Raw Score	Percentile
Verbal	151	49
Quantitative	160	78

This student was accepted into Ph.D. program in biology at the University of Mississippi, with assistantship

Appendix B

Current Year Placement of Graduates

2012 -2013 Graduates and Placement

Graduate	Hon	Conferra I Date	Major 1	Major 2	Minor	Initial Placement
Student 1		5/10/13	Natural Sci (L)			Unknown
Student 2	S	5/10/13	Mathematics		Physics	UCA Graduate Program
Student 3		5/10/13	Biology (Org)			Univ. of Mississippi Graduate Program
Student 4		5/10/13	Chemistry(Bio)		Physics	Seeking employment
Student 5	M	5/10/13	Chemistry(Bio)	Biology		Univ. of Memphis Graduate Program
Student 6	C	5/10/13	Chemistry(Bio)	Biology		Harding Univ. College of Pharmacy
Student 7		5/10/13	Biology		Natural Sci	UAMS College of Pharmacy
Student 8		5/10/13	Chemistry(Bio)	Biology		UT-Memphis College of Pharmacy
Student 9	C	5/10/13	Biology		Natural Sci	Apply for Arkansas Game and Fish jobs
Student 10	M	12/19/12	Biology (Org)			Univ. of Mississippi Graduate Program
Student 11		5/10/13	Biology (Org)			UAM MAT Program
Student 12		5/10/13	Chemistry(Bio)	Biology		Applying to Dental School 2014
Student 13		12/19/12	Natural Sci (L)			Unknown
Student 14	M	12/19/12	Mathematics		Physics	UCA Graduate Program
Student 15		5/10/13	Biology		Natural Sci	Harding Univ. College of Pharmacy
Student 16		5/10/13	Chemistry(Bio)	Biology		UAMS or Harding College of Pharmacy
Student 17		5/10.13	Biology (Org)			UAMS Medical Technology Program
	S=Summa Cum Laude		(L) Life Sci (P) Physical Sci			
	M=Magna Cum Laude		(Bio) Biochem (Org) Organismal			
	C=Cum Laude					

Appendix C

Typical Questions Graduating Senior Exit Interviews

Exit Interview Questions and typical responses

- 1) Ask background information: Name, Hometown, Major, mailing address, email, etc....
- 2) What brought them to UAM?
- 3) How do you rate your time at UAM, 1-5 with 5 being best?
- 4) What were your most favorite parts of your educational experience at UAM?
- 5) What were your least favorite parts of your educational experience at UAM?
- 6) If you could do it over again, would you come to UAM? If no, why not?
- 7) Do you feel that you have received a quality education at UAM? If no, why not?
- 8) Is there anything you would change in your major curriculum?
- 9) Do you feel that your curriculum is up to date and meets the needs of your employer?
- 10) Was your academic advising adequate?
- 11) What about UAM would you change if you were chancellor for the day?
- 12) What are your plans after graduation?
- 13) What are long term plans?
- 14) Is there anything else you would like to tell us?

Most Common Responses:

- 2) Grew up locally, didn't want to go far away. Have family that work in this area. Came because of athletics.
- 3) Most rank either 4 or 5. Occasionally someone ranks a 3. No student gave ranking of 1 or 2.
- 4) Small classes. Get to know professors and other students very well. Cheap. Lots of work study opportunities. Lots of friends here. I learned a lot.
- 5) Upper level courses not offered often enough. Not big enough to avoid course conflicts with multiple sections of some courses. Nothing to do here socially.
- 6) Most answer yes. Those that answer no usually indicate it is for non-academic reasons (lack of social life is most common explanation)
- 7) Most answer yes. The occasional negative answer is often related to not being able to find a job in the area after graduation.
- 8) Reduce the number of labs needed for a degree in sciences. Not teach calculus only at 8:10 a.m. five days a week. Teach Cell Biology before Genetics
- 9) Add Engineering major or Add B.S. Physics degree
- 10) Most say yes. There are a few, especially those that start in general studies, that complain about their first semester advising.
- 11) This question has a wide variety of replies. Improve buildings. Improve parking lots. Give entire campus wireless access. Build a new entrance to the college that doesn't have to go through Drew Central or Monticello schools. Drop athletic programs. Move the campus into town. Change the mascot. Relax the alcohol rules on campus. Drop the history requirement.
- 12) Most already have jobs or professional programs in place. A few students planning to teach are too late to enter MAT program, and therefore have to wait a year.
- 13) Most have specific plans involving family and employment near hometown. A few plan to leave for bigger city.
- 14) This is most often unanswered

Appendix D

Alumni Surveys Samples from past year

Mathematical and Natural Sciences Graduate Survey

Your response is very important to the internal assessment of our programs. Please complete the following. Feel free to give specific examples related to your job, your continued education, or about UAM courses that you have taken. Feel free to attach additional pages if needed. This page is also available on the Math/Science homepage and may be submitted by email as an attachment

What are your plans after graduation?

I am getting married and moving to Rye, Arkansas. I really hope to work for the Fish and Game one day. I am hoping to get a job soon.

Do you feel that UAM prepared you for your professional life?

Yes, UAM did help me prepare for my professional life.

What did you like most about the School of Math and Sciences? (Strengths)

The professors of the School of Math and Sciences really care about their students. They are so passionate about the courses they teach, and that passion translates to their students. The courses are challenging and very interesting.

What did you like least about the School of Math and Sciences? (Weaknesses)

The School of Math and Sciences really needs a new building. That is the only weakness it has.

What changes do you recommend?

I recommend updating the building and labs. I also think that there should be a graduate program. Some people who graduate do not move far, so there are no options for graduate school. I have thought about graduate school, but I am not willing to move far enough away from family to make going a possibility.

Is there anything else you would like to add?

I really enjoyed my experience at the School of Math and Sciences. It is bittersweet to be graduating. I will miss all of the professors that helped me these last four years.

The following information is optional but highly recommended:

Name: _____

Major(s): Biology_____

Minor(s): Natural Science_____

E-mail address @gmail.com_____ facebook user name?_____

Postal Address _____ Telephone number _____

Feel free to drop in for a visit. There's usually coffee available. Students and faculty have tailgating at football games, etc...You are always welcome to join in. Keep in touch!

Please drop off your survey to the Math/Science Office in the Science Center or mail to:

Graduate Survey
School of Math and Sciences
P.O. Box 3480
Monticello, AR 71656-3480

If you don't receive an annual newsletter by mail or electronically, please contact the Math/Science office at 870-460-1016.

Mathematical and Natural Sciences Graduate Survey

Your response is very important to the internal assessment of our programs. Please complete the following. Feel free to give specific examples related to your job, your continued education, or about UAM courses that you have taken. Feel free to attach additional pages if needed. This page is also available on the Math/Science homepage and may be submitted by email as an attachment

What are your plans after graduation?

Pharmacy School at Harding University. Also accepted to UAMS but chose Harding because I liked the faculty and the town better.

Do you feel that UAM prepared you for your professional life?

Yes. Did best on chemistry and biology portion of the PCAT.

What did you like most about the School of Math and Sciences? (Strengths)

All the teachers are friendly. They take the time to get to know you well. They are easy to talk with when additional help is needed.

What did you like least about the School of Math and Sciences? (Weaknesses)

This building is too hot in the summer.

What changes do you recommend?

The Science Center facilities are pretty bad. They really need to be upgraded.

Is there anything else you would like to add?

I wish I would have decided two years ago what I wanted to do. It would have saved me two years.

The following information is optional but highly recommended:

Name: _____

Major(s): Biology and Biochemistry _____

Minor(s): _____

E-mail address @harding.edu (until 2017) _____ facebook user name? _____

Postal Address _____ Telephone number _____

Feel free to drop in for a visit. There's usually coffee available. Students and faculty have tailgating at football games, etc... You are always welcome to join in. Keep in touch!
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What are your plans after graduation?

Pharmacy school at UT-Memphis.

Do you feel that UAM prepared you for your professional life?

Yes, definitely! It was a great choice to come here.

What did you like most about the School of Math and Sciences? (Strengths)

All of the faculty are excellent. Every teacher that I have had has been a great instructor and they have gone out of their way to be helpful.

What did you like least about the School of Math and Sciences? (Weaknesses)

There were a few days that one instructor was a little scatter brained. Maybe didn't prepare for lecture as much as they should have.

What changes do you recommend?

Maybe add more faculty to give more options on courses.

Is there anything else you would like to add?

I'm really glad I came here. It was a good decision.

The following information is optional but highly recommended:

Name: _____

Major(s): _____ Biochemistry

Minor(s): _____ Biology

E-mail address _____@yahoo.com _____ facebook user name? _____

Postal Address _____ Telephone number _____

Feel free to drop in for a visit. There's usually coffee available. Students and faculty have tailgating at football games, etc... You are always welcome to join in. Keep in touch!

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What are your plans after graduation?

Pharmacy School at University of Texas (Also accepted to UAMS, Harding, University of Houston)

Do you feel that UAM prepared you for your professional life?

Yes.

What did you like most about the School of Math and Sciences? (Strengths)

Chemistry department, especially Dr. Taylor, was very strong. His courses prepared me well for pharmacy and the PCAT. The ratio of faculty to students made it easy to get work with faculty.

What did you like least about the School of Math and Sciences? (Weaknesses)

Lab equipment was about the only weakness.

What changes do you recommend?

As a softball player, I would change playing dates back to Saturday-Sunday instead of Friday-Saturday. The amount of time missed was ridiculous.

Is there anything else you would like to add?

I am really glad that I came here. I wouldn't have wanted any other science department.

The following information is optional but highly recommended:

Name: _____

Major(s): Biochemistry _____

Minor(s): Natural Science _____

E-mail address _____ facebook user name? _____

Postal Address _____ Telephone number _____

Feel free to drop in for a visit. There's usually coffee available. Students and faculty have tailgating at football games, etc... You are always welcome to join in. Keep in touch!

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What are your plans after graduation?

Pharmacy school at Harding University. (Also accepted to UAMS, granted interview to OU, but declined offer)

Do you feel that UAM prepared you for your professional life?

I believe so. I had to learn to study and prepare myself for exams. I didn't have very good study habits out of high school. If I had as good of study habits in the beginning as now, I could have had a 4.00.

What did you like most about the School of Math and Sciences? (Strengths)

Small student to teacher ratio in most courses. Faculty are available for one on one help if needed. It is a very welcoming environment.

What did you like least about the School of Math and Sciences? (Weaknesses)

Facilities could be better. Much of the lab equipment is getting old, and it would be nice to use something really nice for a change.

What changes do you recommend?

None

Is there anything else you would like to add?

I'm going to miss everyone in the Science Center a lot.

The following information is optional but highly recommended:

Name: _____
Major(s): Biology and Biochemistry
Minor(s): _____
E-mail address _____ facebook user name? _____
Postal Address _____ Telephone _____

Feel free to drop in for a visit. There's usually coffee available. Students and faculty have tailgating at football games, etc... You are always welcome to join in. Keep in touch!

Please drop off your survey to the Math/Science Office in the Science Center or mail to:

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Mathematical and Natural Sciences Graduate Survey

Your response is very important to the internal assessment of our programs. Please complete the following. Feel free to give specific examples related to your job, your continued education, or about UAM courses that you have taken. Feel free to attach additional pages if needed. This page is also available on the Math/Science homepage and may be submitted by email as an attachment

What are your plans after graduation?

-I plan to continue working on the herbarium database here at the university during the spring semester, as well as seeking opportunities to increase my teaching experience. In the Fall of 2013, I plan to begin attending graduate school, with the long term goal of earning my PhD and teaching biology at the collegiate level.

Do you feel that UAM prepared you for your professional life?

-Yes. UAM as a whole (all departments and administration) has helped me learn to cope with the difficulties of dealing with a large, inefficient bureaucracy. While working for both the IT and Math and Science Department, I learned how to achieve practical goals in an impractical system.

What did you like most about the School of Math and Sciences? (Strengths)

-The School of Math and Sciences is hands down the best department on campus, for a variety of reasons. Let us begin with the faculty. The department faculty all seem to truly get along, both socially and professionally. They all freely work together and are glad to assist one another whenever possible. They also seem to genuinely enjoy one another's company. They are also always willing to go above and beyond when assisting students with their needs, regardless what the needs are. And this attitude does not stop with the faculty. As a student, I have seen this attitude shared with and projected upon the students with whom these faculty members interact. I have studied in many other departments on campus, and in none of them do the students have the kind of positive attitude and desire to help their fellow students. And I attribute that mainly to the example set by the Math and Science faculty.

Also, I personally have been given so many opportunities in the Math and Science department that I would NEVER have been able to have in other departments. As my advisors, Marvin and Karen Fawley have encouraged, directed, and supported me in every way possible since I came to the Math and Science department. They have allowed me to learn a variety of skills, allowed me the opportunity to be a part of scientific publication, and let me design a database project for the UAM Herbarium. John Hunt took me on as a TA for Principles of Biology II Lab. He allowed me to, under his supervision, give the introductory lecture and instruct the second lab section every week. This refined my public speaking and teaching skills, preparing me to instruct labs. More than anything, John Hunt has inspired me to be a teacher. Finally, the department honored me greatly by allowing me to totally independently teach one of Ms. Jessie Chappell's Intro to Biology Lab sections in my last semester. This allowed me to learn the administrative side of collegiate teaching.

Finally, every member of the department as always been willing to answer any question I have had for them, or help me in any way that was possible. That, more than anything else, speaks volumes about the quality of the department as a whole.

What did you like least about the School of Math and Sciences? (Weaknesses)

-The department is vastly underfunded, though that is not the fault of the members of the School of Math and Science. It says a lot about the department when you see how much they are able to accomplish with so little funding. The faculty is as self sufficient as the bureaucracy of UAM will allow them to be. Whether is it installing and managing their own IT equipment (due to the cost prohibitive nature of dealing with the IT department) or lab instructors purchasing materials out of their own pockets, the students have never been left at a disadvantage due to lack of funds.

What changes do you recommend?

-I recommend a new instructor for Compact Calculus. See my former remarks on this subject. Also, Karen Fawley is spread very thin with her current obligations. She is a great asset to the department, due to her grant writing abilities, her research abilities, and the publicity she and Marvin bring the department. She could do so much more if some of her responsibilities could be delegated elsewhere.

Is there anything else you would like to add?

-Simply, I would like to thank the department as a while for all the help and opportunities I have received. I would not be the person I am today without them.

The following information is optional but highly recommended:

Name: _____

Major(s): Organismal Biology _____

Minor(s): N/A _____

E-mail address _____ facebook user name? _____

Postal Address _____ Telephone number _____

Feel free to drop in for a visit. There's usually coffee available. Students and faculty have tailgating at football games, etc... You are always welcome to join in. Keep in touch!

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Appendix E

Graduation Numbers by major per year
Number of majors per year

Math and Science Graduates by Year by Major

								Page	10 yr	3 yr
	06-07	07-08	08-09	09-10	10-11	11-12	12-13	Total	Mean	Mean
Biology	9	15	12	10	7	19	12	177	11.6	12.7
Chemistry	1	2	4	4	6	5	6	59	3.6	5.7
Mathematics	5	6	2	4	0	8	2	71	4.4	3.3
Natural Science*	3	7	2	8	4	12	2	47	4.7	6
Total	18	30	20	26	17	44	22	354	24.3	27.7
	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06
Biology	10	11	13	6	6	9	4	12	10	12
Chemistry	4	3	3	5	4	2	2	4	2	2
Mathematics	2	5	1	4	5	5	5	3	9	5
Natural Science*	-	-	-	-	-	0	0	4	1	4
Total	16	19	17	15	15	16	11	23	22	23

*Natural Science degree added in 2001

Majors By Class For Fall Terms

Major	Level	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Biology	Freshman	14	10	10	11	9	8	9	7	10	16
	Sophomore	12	8	7	4	10	7	11	8	3	10
	Junior	8	10	7	8	7	8	9	10	9	6
	Senior	11	13	11	13	18	15	17	12	20	16
	Pre-Freshman	0	0	3	1	3	1	3			
	Special*	0	0	0	1	0	0	1			
	Post Bach	0	3	0	1	0	0	2			1
	Total	45	44	38	39	47	39	52	37	42	49
Chemistry	Freshman	3	3	5	6	3	1	3	5	3	6
	Sophomore	2	2	5	3	2	1	0	2	3	4
	Junior	2	2	1	5	7	2	2	2	3	4
	Senior	0	2	3	2	2	8	5	9	5	4
	Pre-Freshman	0	0	0	3	0	0	1			
	Special*	0	0	0	0	0	0	0			
	Post Bach	1	0	0	0	0	0	1			
	Total	8	9	14	19	14	12	12	18	14	18

Mathematics	Freshman	3	3	7	4	6	3	5	7	9	8
	Sophomore	8	6	3	5	7	7	5	5	3	5
	Junior	5	5	6	5	1	5	5	3	4	3
	Senior	11	13	7	7	8	2	5	5	5	3
	Pre-Freshman	0	0	0	1	0	1	2			
	Special*	0	0	0	0	0	0	0			
	Post Bach	0	0	0	0	1	0	0		1	
	Total	27	27	23	22	23	18	22	20	22	19
Natural Science	Freshman	1	2	2	1	1	0	0	1	2	
	Sophomore	3	2	0	0	1	1	0	1	2	2
	Junior	3	2	2	3	2	1	0	1	4	3
	Senior	2	4	8	6	6	4	4	3	4	3
	Pre-Freshman	0	0	0	0	0	1	0			
	Special*	0	0	0	0	1	0	0			
	Post Bach	0	0	0	0	0	0	1			
	Total	9	10	12	10	11	7	5	6	12	8
Major	Level	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Pre-Medicine	Freshman	26	28	19	30	20	16	14	28	20	23
	Sophomore	9	5	5	7	5	7	4	2	7	6
	Junior	10	7	5	2	3	5	4	2	3	7
	Senior	7	3	2	0	0	1	0	1	2	4
	Pre-Freshman	1	0	5	21	21	20	19			
	Special*	0	0	0	0	0	0	0			
	Post Bach	0	2	0	0	0	0	0		1	1
	Total	53	45	36	60	49	49	41	33	33	41
Pre-Pharmacy	Freshman	11	13	14	14	16	15	8	14	15	18
	Sophomore	3	6	9	8	3	9	7	3	8	5
	Junior	9	2	4	6	3	3	4	6	3	5
	Senior	3	3	1	4	0	1	0		3	4
	Pre-Freshman	1	0	1	7	7	12	5			
	Special*	0	0	0	0	0	0	0			
	Post Bach	0	0	2	0	0	1	0			
	Total	27	24	31	39	29	41	24	23	29	32
Pre-Engineering	Freshman	6	4	7	11	7	5	10	6	9	10
	Sophomore	1	1	2	3	3	2	2	2	1	2
	Junior	2	0	0	0	1	1	2			
	Senior	0	0	0	0	0	0	0			
	Pre-Freshman	1	0	0	1	3	2	0			
	Special*	0	0	0	0	0	0	0			
	Post Bach	0	0	0	0	0	0	0		1	
	Total	10	5	9	15	14	10	14	8	11	12

Allied Health	Freshman	13	27	16	13	28	23	16	25	29	30
	Sophomore	5	5	8	8	8	8	11	6	12	11
	Junior	4	2	4	3	4	3	4	4	5	6
	Senior	2	0	3	0	0	2	1		1	2
	Pre-Freshman	0	0	0	9	8	5	9			
	Special*	0	0	0	0	0	0	0			
	Post Bach	0	0	1	0	0	0	0			
	Total	24	34	32	33	48	41	41	35	47	49
Math and Science	Totals	204	198	195	237	235	217	211	180	210	228

Appendix F

Example Letter and Email to Reconnect with Potential Degree Completion or Professional School Candidates

Sample letter sent to student that required only a few courses to complete degree

September 9, 2012

{Name 1} {Name 2}
{Address 1}
{Address 2}
{City} {State} {Zip}

Dear {Name 1}

I am writing this letter to encourage you to finish your {major} degree. You may not be aware that some changes have been made to reduce the general education requirements and also lowering the number of hours to complete your degree to 120 hours. You are extremely close to finishing, and I would like to see you complete the degree. Of course, you can take courses on our campus, possibly on-line courses from our campus, or even courses at another university and transfer them back to UAM. If you are interested, contact me by telephone at 870-460-1116 or by e-mail at bramlett@uamont.edu.

You may consider changing your major from Biology to Natural Sciences (Life Science Option). Instead of taking required biology courses, you can take one of several elective courses to complete your degree. Either degree will allow you to enter the MAT program and teach science, as you previously indicated. Another option is the Bachelor of General Studies degree, which is a new degree that was just approved at UAM. In reviewing your transcript, it appears that you would need approximately the same number of classes as needed for the Natural Science degree. We will review all options to see which will allow you to complete your degree in a timely fashion.

I'd love to hear from you even if you aren't interested in returning at this time.

Take care,

J. Morris Bramlett, Ph.D.
Dean, School of Mathematical and Natural Sciences

Sample email sent to student that needed to transfer hours back from professional school to graduate.

Sent: 5/19/2012

To:

Hi xxxxxx,

It took forever to track you down, but I'm glad I was finally able to. I don't know if you realize it or not, but you have completed more than 93 hours from UAM, with more than 12 hours upper level courses, and you have completed your gen ed requirements. Since you have already completed pharmacy school, you can transfer credits back to UAM and obtain your degree.

All you have to do is have a transcript sent to UAM's registrar from the College of Pharmacy Registrar at UL-Monroe (They have to send it directly to them). Then complete a graduation application with our registrar's office. You can contact Debbie Bryant at 460-1135 for more details on how to handle the transcript and ask about filing an application for graduation.

I'd love for you to be an alumnus of UAM!

Morris