

Annual Assessment Report

2011-2012

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](http://www.uamont.edu/Math_and_Sciences/annualreports.htm).

July 2012

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

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
<p>The mission the University of Arkansas at Monticello shares with all universities is the commitment to search for truth, understanding through scholastic endeavor.</p>	1,2,3
<p>The University seeks to enhance and share knowledge, to preserve and promote the intellectual content of society, and to educate people for critical thought.</p>	2, 3
<p>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.</p>	1, 2, 3
<p>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.</p>	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

In the Fall 2011 Introduction to Organic and Biochemistry course a pretest was given in which ten questions were taken from the final exam of the previous year. The questions selected were basic in terms of difficulty. On the pretest, the class average was a 3.5 correct out of 10 questions (15 students tested). Students that took the General Chemistry I and General Chemistry II courses as prerequisites scored almost two points higher than those that took only Introduction to Chemistry or had only General Chemistry I as the prerequisite course. The same ten questions were asked again as part of the final exam, and the overall average was 8.9 correct out of 10 questions (12 students tested). Even though the questions were basic in nature, there was a huge improvement in the scores on these questions from the pre-test to 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. An ACT math score of 19 is needed to enter college level math courses. In the Fall 2011 Intermediate Algebra courses, 143 out of 322 students initially enrolled took the ASSET test as the final exam. Of the 143 that took the test, 93 scored the equivalent of a 19 ACT, or above ($93/143 = 65\%$ passing). There were 32 students that scored high enough on the ASSET exam to move on to College Algebra despite having a D, F, or W as a grade in the Intermediate Algebra course. These students were tracked into the Spring 2012 College Algebra and Survey of Math courses, and it was found that of the 32 that were allowed the opportunity to move on to college level math, only 17 actually moved up. Of the 18 that attempted college math, there were 7 F's, 3 W's, 4 D's, 3 C's, and one B. It is clear that passing the exam does not necessarily indicate preparedness for the next course in sequence. The Spring 2012 Intermediate Algebra courses had 83 of 122 test takers scoring a math score equivalent to 19 ACT (68% passing). There were 242 students originally enrolled in the course. The percentage of students passing the ASSET exam was somewhat lower than the success rate in the previous year (83%). This is attributed to the fact that several students stayed in the course hoping that a sufficient ASSET score would enable them to take a college level math course, despite a failing grade in Intermediate Algebra. Initially essentially none of the students possessed scores that would allow them to enter a college level math 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.

Performance on National Exams

Two Chemistry courses, General Chemistry II and Organic Chemistry II, use the American Chemical Society Standardized Final Examination prepared by the ACS Testing Institute. The ACS provides national comparison data for schools using the exams. These exams are very rigorous and thorough, and are sometimes used as an indicator of quality of instruction for departments that are seeking ACS accreditation. This year, the Organic Chem II class had the unprecedented record of no students failing

or withdrawing from the course. The students scored above the 56th percentile nationally, as a class average. This makes 15 of 19 years that the UAM Organic Chem II students have scored at or above national average on this exam. The top performer scored 97th percentile on the exam. One fourth of the class scored in the upper 25th percentile nationally. Thirteen out of 24 students (54%) scored above the 50th percentile nationally. The results look good; however, are even more impressive when you consider the list of universities used to set the percentile comparisons for the exam. A large percentage of the universities are very exclusive private universities with very high entrance standards. For an open admissions university chemistry class that isn't separated into majors and non-majors to finish above national average is really quite impressive. 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 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 39th 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 three 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. The general chemistry faculty also plan to look into other textbook options for the course.

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, six students took the Medical College Admissions Test (MCAT) with 5 students 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 scores for the five students ranged from 23 to 39 out of 45. One score, the 23, was slightly below the 50th percentile nationally. The 25 composite score is near the 50th percentile. The composite scores of 28, 34, and 39 were well above the national average. Both the 34 and 39 composite scores are above 90th percentile, nationally. The score of 39 ranks in the top one 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. The

students with composite scores of 34 and 28 were accepted into medical school, along with the student that scored a 32 composite score last year. The student with the 25 composite score withdrew his application after been accepted into dental school. The student with the 23 composite score did not apply to medical school due to personal reasons. The student that did not self report their scores to UAM has not completed all requirements to apply to medical school. It is likely that this student took the exam just to see where they would score. The student with the composite score of 39 is applying for admission into the 2013 entering class. The MCAT scores, and a table for national comparison, are shown in Appendix A.

Four students took the PCAT exam in the past year with scores ranging from to 31 to 51 on a 100 point scale. The exam has subscores 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. In the past, UAM students scored fairly well on the quantitative section of the PCAT scoring approximately 54 out of 100; however, in the past three years there have been major changes in the quantitative section. Calculus has always been a minor part of the quantitative section, but is now a major portion of the exam. This year, the students quantitative scores were the lowest. Even the publishers of the new study guides admit that their guides have not successfully grasped the broadness of the material covered in the quantitative portion of the exams. 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 the students admitted in the last class were very good. As in the past, organic chemistry and biochemistry appear to be very strong points. They are very pleased with the overall science background of the UAM students. He went on to say that he felt every student accepted from UAM over the past several years has been a quality student and deserved to be there. The UAM students that have struggled in the pharmacy program have done so due to outside factors such as family problems, illness, and financial issues. This year's class had two students apply, with one being accepted. The successful applicant was accepted to both UAMS and UL-Monroe. The student chose to attend UAMS despite being a Louisiana resident. The unsuccessful applicant did not have a competitive grade point average or PCAT score.

Two students took the Dental Aptitude Test (DAT) in the past year. Both scored above national average on the exam. One student received early acceptance into the dental program at UT-Memphis. The other applicant was not accepted despite having a good DAT score and GPA. 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. Both scores from this year are well above average on both the quantitative and verbal sections. 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. All chemistry faculty are involved in the grading of the papers and oral presentations. In the past year, six students enrolled in Advanced Lab Techniques; however, two withdrew from the course. Four students did papers and presentations. Of the four students, the faculty felt that one student did an outstanding job at meeting the learning objectives. Two of the students met the student learning outcomes at the above average level. One student did poorly on the paper and presentation. This student also performed very poorly on assignments related to learning the use of lab equipment and received a grade of F.

Four students involved in chemistry research did presentations at professional meetings. In each case, the students' preparation of the research poster or oral presentation was excellent. All demonstrated successful accomplishment of student learning outcomes.

Name	Meeting	Title
Nathan Probst	NASA-Arkansas Space Grant Consortium Annual Symposium	Nitrate Stability Comparisons in Cabbage and Lettuce
Misty Jager (3 related presentations)	NASA-Arkansas Space Grant Consortium Annual Symposium Arkansas INBRE Annual Conference Posters at the Capitol	Methods of Determining Fatty Acid Content in Native Arkansas Algae
Trent Roberts	NASA-Arkansas Space Grant Consortium Annual Symposium	Effect of Temperature on Nitrate Reduction in Lettuce During Storage.
Esgar Jimenez	ARK-LSAMP Spring Research Conference	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. Eighteen students completed the course in the 2011-2012 academic year. Twelve of the students did an excellent job finding related references, writing the paper, and presenting the information in the seminar. Five 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, but did finally complete the research paper and oral presentations and meet the learning objectives at the satisfactory level.

Eleven 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 excellent knowledge of the topics and performed exceptionally well in preparing the poster or digital presentation. The presentations are listed below:

Name	Meeting	Title
Robert Rose	Posters at the Capitol	Investigation in Growth and Tumor Development
John "Bo" Kelley	Arkansas Academy of Science	Searching for Beetles Associated with the Dung of Native Arkansas Mammals
Doug Cagle & Heather Peek	Posters at the Capitol	Sexual Dimorphism in Body Size of Baird's Pocket Gopher in Northern Louisiana
Nathan Probst	Arkansas INBRE Annual Conference	Phylogenetic analysis of newly discovered member of the algal class Eustigmatophyceae
Nathan Probst	Posters at the Capitol	Sequence Analysis in the Algal Class Eustigmatophyceae
D. Brown, R. Crift, K. Newhouse, M. Ohannes,	ARK-LSAMP Spring Research Conference	Evaluation of the DNA Sequences from the Nuclear Ribosomal Internal Transcribed Spacer Region for Use in Delimiting Species of the alga, Eustigmatophyceae
Elia Garcia & Darren White	ARK-LSAMP Spring Research Conference	The Use of Plastid Barcoding DNA Sequences to Characterize the Sedge Species, <i>Carex nigromarginata</i> and <i>Carex floridana</i> .

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
Jaime Garcia	ARK-LSAMP Spring Research Conference	Regular quasiperiodic response of a Duffing oscillator driving by chaotic signals
Jaime Garcia	Posters at the Capitol	Dynamics of a Non-linear Oscillator Driven by Pulse Width Modulated Waves
Kylen Criner	ARK-LSAMP Spring Research Conference	Detection of chaos encryption in steganography

Overall, the School of Math and Sciences had 15 research projects involving students. From these projects there have been 21 professional presentations, 3 publications in refereed journals, and several

grants that had contributions from student researchers. These students are recognized for being excellent students and are highly sought after for graduate programs.

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. 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.

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. We are in the second 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. We have added an additional faculty that will teach courses in remedial mathematics and physics. The two or three additional sections of remedial math should decrease the number of students per section and allow more

in class hands-on computer time with ALEKS. The faculty feel that this will reduce the initial frustration that many of the students feel when starting ALEKS. Hopefully we will see a reduction in the number of walk away F grades.

The math faculty continue to have discussions on where systems of linear equations should be taught. The concept is introduced in Introduction of Algebra, but most of the coverage is found in Intermediate Algebra because it is a topic often seen on the ASSET exam. By introducing the concept and the graphing of these equations in Introduction to Algebra, a foundation is laid that can be built upon in Intermediate Algebra. This also diminishes the difficulty gap between Introduction to Algebra and Intermediate Algebra. There continues to be some tweaking of the material taught in each course to better align the courses. The ALEKS provider also makes minor changes in their customized package to make sure the materials covered are closely connected to the assessments, practice tests, and homework.

Survey of Math courses have recently adopted an online homework system which provides immediate feedback. The courses are currently using My Math Lab on a trial basis in hopes that the students work more practice problems prior to the exams. The math faculty feel that this will also provide a method of discovering struggling students earlier in the term, and allow additional tutoring to help them get through the course.

In the upper level mathematics courses, we have re-distributed courses so that the junior and senior level courses are taught by faculty who have the most expertise in that subject. Recently, Discrete Mathematics was given to Dr. Sayyar from another faculty member because Dr. Sayyar's strong background in that area will allow for more in depth coverage of the course material.

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.

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.

In the capstone courses there are changes made periodically. While some 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. This year, the student output was very good for the most part. 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. In Biology Seminar, a topic focus has been implemented in order to give all participants a deeper understanding of a major concept. This year, students read a book related to environmental issues. There were class discussions and even some small group work. From these discussions, each student chose a seminar topic that was closely related to one of the case studies. While one seminar gives the audience some basics, having several closely linked seminars gave a much deeper understanding for the participants. Each year, topics will be selected that are an extension of concepts learned in other course work.

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. Four years ago, we rarely had students presenting at meetings. This year 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 over the last 5 years.

Most graduating seniors take part in exit interviews with the Dean of Math and Sciences. See Appendix C for a list of typical questions asked. The students are typically very positive about their experience at UAM. The most common positive statements usually are geared toward how a specific instructor made a difference in their education. Several students are very appreciative of the Math and Science scholarships they receive. There are very few negative comments about our programs; however, there is the occasional complaint about a specific instructor. Several mention the condition of

equipment and the labs as weaknesses.

Alumni surveys are often sent out with newsletters mailings, and by email to the alumni with known email addresses. 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 grad surveys received in the last three years, 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.

Each year UAMS College of Medicine hosts pre-med advisors meetings, and on an occasional basis the College of Pharmacy hosts the pre-pharmacy advisors. This year, Dean Bramlett attended each of those meetings. Although very little specific information is provided about performance of our students during the meeting, there is information provided in private conversations. The information is not student specific in order to not violate FERPA laws, but is more general in nature. This year, all comments about UAM students currently in their program were very positive, with one student doing exceptionally well (based on student info, all A's). The College of Pharmacy also spoke highly of our students but did indicate that at least one of our students had struggled and would likely have to repeat the first year. They attributed this to personal issues, and not lack of academic preparation.

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.

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. The new text that has been chosen for organic chemistry will provide more detail in this area. The faculty that are teaching general chemistry will attempt to provide additional coverage on this topic. In the past, this topic was covered very briefly due to time constraints.

Many of the advisors, especially in the pre-professional and allied health programs, are planning group advising sessions. 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. We have been in contact with advisors/recruiters at UAMS and they are excited about the opportunity to speak with students early in their college career. At this time, UAMS recruiters from two different areas are planning to come to one or more of the sessions.

During faculty development week meetings, an assessment committee will be formed in the School of Math and Sciences involving faculty from each discipline. 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 is in the final stages of development of a similar product for College Algebra. College Algebra, Calculus I, and Calculus II are trying the WebAssign online homework system on a free trial basis.

The mathematics tutoring has been moved primarily to the Science Center. We now hire math majors as tutors, and keep the tutor room open essentially all day long for those that need additional assistance. The tutoring is done in the computer lab, so that students needing help with ALEKS will have easy access. To make ALEKS more accessible to our students, and even make it possible for entire classes to use our computer lab, we are planning to add some resurrected computers to our computer lab.

In chemistry, some preliminary work has been done 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 are purchasing equipment to make the final product work even better.

The decision has been made to upgrade the biology labs to improve the hands-on aspect of dissections and slide viewing. Audiovisual equipment will be added to two biology labs in which dissections are commonly done. We have not decided whether to mount projectors, or actually go with large screen television monitors with computers and document cameras.

At the urging of the system president, we continue to discuss the possibility of more on-line courses in Math and Sciences. 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.

To alleviate advising errors by general education advisors, several faculty spent a few minutes of the first day of class to do some basic academic advising. This allowed several students to get into the proper courses needed for their career plan. Many general education advisors encourage students to just take the basics, which may be okay for a non-science major, but for someone whose plans are to possibly attend pharmacy school, they are a year behind based on the opportunity to take specific courses that are only taught once per year.

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.

The information is organized, and the Annual Assessment Report is written by the dean.

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 three years. Over the past three year period, more than 40 classroom visits in the local schools have been done by Math and Science faculty. Many of these visits have been guest teaching appearances in Advanced Placement Chemistry courses at Hamburg, Crossett, Rison, Star City, Sheridan, and Monticello schools. In each visit, a lecture over a subject that the high school teacher felt he/she was weak in was done. Recruiting information was also made available to the students and teachers. The large number of visits to Hamburg in 2009-10 appear to have paid off with 6 of the 10 AP students from that year's graduating class attending UAM. On the first visit of the year, only one student indicated they were coming to UAM.

In addition to the classroom visits, the School of Mathematical and Natural Sciences and the Education Renewal Zone hosted four different Saturdays of Advanced Placement test prep in which 90 -150 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/RSF/. At all of 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 at: http://www.uamont.edu/Math_and_Sciences/curriculum.htm. Scholarships are also provided by the School of Mathematical and Natural Sciences. For 2010-11, \$10,321 were awarded per semester. In the 2011-12 academic year, \$9955 per semester was awarded. In the upcoming year, \$10,160 will be awarded to approximately 30 students. These awards greatly reduce the financial burden on those that are attending college, thus improving retention. This year, a new scholarship will be offered for the first time; the Robert H. Moss Endowed Scholarship.

The scholarships that will be awarded by Math and Sciences beginning in the Fall 2012 term will be:

ENDOWED SCHOLARSHIPS

Name	BUDGET
	2011/2012 Amt Per Semester
Dr. Van C. Binns Scholarship - Pre-Medicine	925
***Anthony T. and Faye Chandler Scholarship	110
James Gordon Culpepper Scholarship	525
Gregory Alan Devine Memorial Scholarship	700
Dr. Albert L. Etheridge Scholarship	540
William and Anna Hill Scholarship	1,665
Wilburn C. Hobgood Scholarship	490
Mr. Jim Huey Scholarship	330
Dr. C. Lewis & Wanda W. Hyatt Endowed Scholarship	355
Victoria Ku Scholarship	470
Mathematics Scholarship	250
Mathematics & Physics Scholarship	365
Miller Sisters' Scholarship - Science	840
Robert H. Moss Endowed Scholarship	300
Herman C. Steelman Scholarship	380
Jack H. Tharp Scholarship	700
Carolyn Hibbs Thompson Chemistry Scholarship	900
Dr. Paul Allen Wallick, Sr. Scholarship	315
	<u>\$ 10,160</u>

Many of the above scholarships will be split among several students

	Balance
Mathematical & Natural Sciences Non-Endowed Sch	<u>2/28/2012</u>
Math & Natural Sciences Scholarship	\$1,055

The funds in the non-endowed scholarship are often used to aid in degree completion of seniors who have exhausted their state or athletic scholarships.

The School of Mathematical and Natural Sciences also uses both institutional and federal work study funds to employ as many of our students as possible. They are employed as general office help, math tutors, lab teaching assistants, graders, museum and herbarium help, and research assistants. It is a strong belief that the

more the student works on campus, the stronger the connection the student will have with the University, and the more likely the student will be to graduate.

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 64, 2011-13 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 over the past several years, 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. Currently I am assisting 2 drop outs that are making plans to complete their degree. Others are strongly considering the possibility. 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.

**Appendices for the
Annual Assessment Report
2009-2010**

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 2011	The Psychological Corporation
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Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	400	48
Biology	421	80
Reading Comprehension	397	40
Quantitative Ability	385	17
Chemistry	392	32
Composite	399	41

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

Student A (same student as above)	Test Date July 2011	The Psychological Corporation
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Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	403	53
Biology	401	49
Reading Comprehension	402	48
Quantitative Ability	396	34
Chemistry	389	28
Composite	398	39

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

This student has not applied to any pharmacy programs

Student B

Test Date July 2011

The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	374	12
Biology	411	66
Reading Comprehension	378	15
Quantitative Ability	383	15
Chemistry	422	77
Composite	394	31

Writing Scores	Your Score	Avg Score
Conventional Language	3.0	2.74
Problem Solving	3.5	2.74

This student has not applied to any pharmacy programs.

Student C

Test Date January 2012

The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	437	92
Biology	414	71
Reading Comprehension	376	13
Quantitative Ability	387	20
Chemistry	405	53
Composite	404	51

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	2.74
Problem Solving	Unreported	2.74

This student applied to, and was accepted to UAMS and UL-M Colleges of Pharmacy. She has chosen to attend UAMS, beginning August 2012.

Student D Test Date January 2012 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	395	40
Biology	417	75
Reading Comprehension	393	34
Quantitative Ability	371	5
Chemistry	422	77
Composite	400	43

Writing Scores	Your Score	Avg Score
Conventional Language	Unreported	2.74
Problem Solving	Unreported	2.74

This student has not applied to any pharmacy programs.

MCAT Test Scores

Student A

Test Date	July 2011	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 for admission into the Fall 2012 entering class at UAMS.

Student B

Test Date	July 2011	Score	Percentile
	Verbal Reasoning	8	37.9-52.7
	Physical Sciences	7	25.8-38.5
	Writing Sample	M	12.1-35.1
	Biological Sciences	8	28.1-40.8
	Total Score	23-M	32.4-37.7

This student has never applied to any medical schools.

Student C

Test Date	July 2011	Score	Percentile
	Verbal Reasoning	11	86.0-96.2
	Physical Sciences	11	78.6-88.5
	Writing Sample	N	32.6-41.1
	Biological Sciences	12	88.2-95.2
	Total Score	34-N	91.2-93.8

This student was accepted for admission into the Fall 2012 entering class at UAMS

Student D

Test Date	September 2011	Score	Percentile
	Verbal Reasoning	10	71.4-85.9
	Physical Sciences	7	23.2-38.8
	Writing Sample	P	54.3-63.9
	Biological Sciences	8	24.9-40.2
	Total Score	25-P	43.7-49.7

This student applied for medical school, but withdrew application upon being accepted into dental school.

Student E September 2011

This student did not report scores to UAM

This student did not apply to any medical schools

Student F

Test Date	June 2012	Score	Percentile
	Verbal Reasoning	11	86.0-96.2
	Physical Sciences	14	97.4-99.9
	Writing Sample	M	10.9-32.2
	Biological Sciences	14	97.8-99.4
	Total Score	39-M	99.2-99.5

This student has applied for August 2013 admission at several schools.

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

August 2011 Test Date

	Score	Percentile
Perceptual Ability	17	42
Quant. Reasoning	16	64
Reading Comp.	19	52
Biology	17	49
Gen Chemistry	17	47
Org Chemistry	21	86
Total Science	18	63
Academic Avg	18	63

This student was admitted to the August 2012 entering class of the UT-Memphis College of Dentistry

Student B

September 2011 Test Date

	Score	Percentile
Perceptual Ability	15	20
Quant. Reasoning	12	11
Reading Comp.	18	52
Biology	15	26
Gen Chemistry	12	4
Org Chemistry	15	30
Total Science	14	14
Academic Avg	14	12

This student applied but was not accepted into dental school.

Student C

August 2011 Test Date

	Score	Percentile
Perceptual Ability	25	99
Quant. Reasoning	19	91
Reading Comp.	22	84
Biology	16	35
Gen Chemistry	18	62
Org Chemistry	18	60
Total Science	17	49
Academic Avg	19	78

This student applied but was not accepted into dental school.

Student D

August 2011 Test Date

	Score	Percentile
Perceptual Ability	21	88
Quant. Reasoning	19	92
Reading Comp.	22	85
Biology	17	50
Gen Chemistry	18	65
Org Chemistry	16	39
Total Science	17	50
Academic Avg	18	66

This student has not applied to dental school.

GRE Scores

Student A July 2012

	Raw Score	Percentile
Verbal	162	90
Quantitative	158	74

This student is applying for August 2013 admission into several Ph.D. programs in biology

Student B March 2012

	Raw Score	Percentile
Verbal	158	79
Quantitative	160	84

This student took the chemistry subject exam portion of the GRE and scored a raw score of 750, which is 72nd percentile

This student was accepted into the 2012 entering class of the UAMS College of Medicine

Appendix B

5-Year Initial Placement of Graduates

Student #	Grad date	Major 1	Major 2	Minor	Placement
1	12/21/11	Biology (Org)		NA	unknown
2	5/11/12	Natural Sci			UAMS College of Pharmacy
3	5/11/12	Biology		Natural Sci	UAMS-Medical Technology
4	5/11/12	Chemistry		Biology	Ainsworth Pet Products, Dumas
5	5/11/12	Biology		Natural Sci	Warren Animal Clinic
6	8/8/11	Natural Sci			UAM Grad Asst-Basketball
7	5/11/12	Chemistry		Biology	UAMS College of Pharmacy
8	5/11/12	Natural Sci			UAMS College of Pharmacy grad
9	5/11/12	Biology			UAMS College of Pharmacy
10	5/11/12	Biology		Chemistry	UAMS-Medical Technology applic. Internship at UALR
11	5/11/12	Mathematics		Physics/Nat Sci	UCA MS Mathematics
12	5/11/12	Biology		Natural Sci	Wal Greens, Pharm Tech
13	5/11/12	Natural Sci		NA	Applying to UA-Biology grad program
14	5/11/12	Natural Sci			Radiology UAMS grad
15	8/8/11	Mathematics		Collateral	Teaching in Greenville, MS area
16	5/11/12	Natural Sci			Radiology UAMS grad
17	5/11/12	Mathematics		Spanish	MAT and teaching at Hamburg
18	5/11/12	Natural Sci (L)		Spanish	unknown
19	8/8/11	Mathematics		Chemistry	unknown
20	12/21/11	Biology		Natural Sci	unknown
21	12/21/11	Mathematics			UAM MAT in Mathematics
22	5/11/12	Natural Sci		NA	unknown
23	5/11/12	Biology		French	Applied for zookeeper internship
24	12/21/11	Mathematics		Coaching	MAT
25	12/21/11	Mathematics		Physics	unknown
26	5/11/12	Natural Sci			UAMS College of Pharmacy grad
27	5/11/12	Biology		Military Sci	Military
28	5/11/12	Biology	Chemistry	NA	UAMS College of Medicine
29	5/11/12	Natural Sci (L)		NA	Applying to graduate programs
30	5/11/12	Biology	Chemistry	NA	UAMS College of Medicine
31	5/11/12	Biology			UAMS College of Pharmacy grad
32	12/21/11	Natural Sci		NA	Ainsworth Pet Products, Dumas
33	5/11/12	Biology	Chemistry	NA	applied to several biology Ph.D.
34	5/11/12	Biology (Org)		NA	applying to grad programs in future
35	12/21/11	Biology		Natural Sci	unknown
36	5/11/12	Natural Sci			UAMS College of Pharmacy grad
37	5/11/12	Mathematics		Natural Sci	Private Business
38	12/21/11	Biology		Chemistry	UCA Physical Therapy
39	5/11/12	Biology		NA	UT-Memphis College of Dentistry
40	5/11/12	Biology		Natural Sci	UAMS College of Pharmacy
41	8/8/11	Biology		Natural Sci	ULM College of Pharmacy
42	2011	Biology	Chem (Biochem)	Spanish	UAMS College of Medicine
43	2011	Biology		Chemistry	Environmental Testing Service

44	2011	Biology		Physics	Univ. of Miss. College of Pharmacy
45	2011	Biology	Chem (Biochem)		Halliburton Research Services
46	2011	Biology		Chemistry	Continuing Education at UAM
47	2011	Biology	Chem (Biochem)		Dayspring Behavioral Health Serv.
48	2011	Biology	Chem (Biochem)		Tulane Univ. M.S. Cell Biology prgm
49	2011	Chem (Biochem)		Math	Univ. of Okla. College of Pharmacy
50	2011	Chem (Biochem)		Biology	Crossett High School-Chem teacher
51	2011	Natural Sci (Life Science Option)		Chemistry	Hospital Laboratory, Hot Springs, AR
52	2011	Natural Sci (Life Science Option)			Plans to enter MAT program and teach science
53	2011	Natural Sci (Life Science Option)			Plans to enter MAT program and teach science
54	2011	Natural Sci (Life Science Option)			Plans to enter Nursing program
55	2010	Biology	Psychology	Natural Science	Ph.D. Program in Psychology in Ohio
56	2010	Biology		History	Technician, Arkansas State Crime Lab
57	2010	Biology	Chemistry		Plans to teach secondary science in Texas
58	2010	Biology		Natural Science	Applying to dental school
59	2010	Biology		Chemistry	Pharmacy School (UAMS)
60	2010	Biology	Chemistry	Spanish	UAMS College of Medicine
61	2010	Biology		Natural Science	Return to Puerto Rico, pre-med internship
62	2010	Biology		Chemistry	D.O. Medicine program at William Carey U.
63	2010	Biology	Chemistry	Spanish	UAMS College of Medicine
64	2010	Biology	Mathematics		M.S. Prgm in Foresic Chemistry; Sam Houston State
65	2010	Mathematics		Sociology	MAT program UAM
66	2010	Mathematics		Spanish	MAT program UAM
67	2010	Mathematics		Coaching	MAT program UAM
68	2010	Natural Science (Life)			unknown
69	2010	Natural Science (Life)			Private Business, Hamburg
70	2010	Natural Science (Life)			Chiropractic School, Dallas TX
71	2009	Agriculture			UAMS College of Pharmacy
72	2009	Biology		Chemistry	UAMS College of Medicine
73	2009	Biology		Natural Science	unknown
74	2009	Biology		Chemistry	ArKat microbiology labs, Dumas, AR
75	2009	Biology		Chemistry	Ph.D. Biochemistry, UAMS
76	2009	Biology		Chemistry	Ph.D. Biology program, University of Arkansas (Aug09)
77	2009	Biology		Chemistry	Chemist; ArKat, Dumas, AR
78	2009	Biology		Natural Science	Law School UALR
79	2009	Chemistry		Mathematics	Ph.D. Chemistry program, University of Mississippi
80	2009	Chemistry		Mathematics	Ph.D. Chemistry program, University of Arkansas
81	2009	Chemistry		Mathematics	Offered position at chemical company in KS
82	2009	Mathematics		History	Math Teacher-?
83	2009	Mathematics		Psychology	unknown
84	2009	Natural Science (Life)			Entergy, Glendale, AR
85	2009	Natural Science (Life)			Employed at Southeast Arkansas Education Cooperative

86	2009	Natural Science (Life)			Applying to MAT Program at UAM
87	2009	Natural Science (Life)			Arkansas State Parks
88	2009	Natural Science (Life)		History	Mississippi Agri Extension Service
89	2008	Biology		Chemistry	Alternate Southern College of Optometry
90	2008	Biology		Chemistry	Teaching Chemistry at Monticello H.S.
91	2008	Biology		Chemistry	Medical Dosimetry Prgm, UAMS
92	2008	Biology		Natural Science	Pilot training program, HSU
93	2008	Biology		Natural Science	Teaching Biology at McGehee High School and MAT Program
94	2008	Biology		Spanish	Chiropractic School in Dallas
95	2008	Biology		Political Science	Graduate School LSU in Environmental Science
96	2008	Biology		Natural Science	Graduate School Univ. of Arkansas, Molecular Biology/Poultry Sci
97	2008	Biology		Natural Science	Entering Radiology Tech program
98	2008	Biology		Chemistry	Applying to med school after wife complets MAT program
99	2008	Biology		Natural Science	Recently married, no current job plans
100	2008	Biology		Natural Science	Entering Radiology Tech program
101	2008	Biology	Chemistry		Entering graduate school at U-Cal San Diego in Chemistry
102	2008	Biology		Chemistry	UAM College of Medicine
103	2008	Biology		Natural Science	Ph.D. Molecular Biology program, University of Arkansas
104	2008	Biology		Natural Science	Pursuing teacher certification in the Chicago Area
105	2008	Biology		Wildlife Management	Housewife
106	2008	Biology		Natural Science	UAM Nursing program
107	2008	Chemistry		Mathematics	Entering Graduate School Univ. of Minnesota in Chemistry
108	2008	Chemistry	Biology		UAM School of Mathematical and Natural Sciences, Adjunct & Asst Dir ARKLSAMP
109	2008	Mathematics		History	unknown
110	2008	Mathematics		Natural Science	M.S Mathematics, UALR
111	2008	Mathematics		Coaching	Teaching math at Monticello H.S. and MAT Program
112	2008	Mathematics		CIS	Teaching math at McGehee
113	2008	Mathematics		Physics	Teaching math at Crossett H.S. and MAT Program
114	2008	Natural Science		Agriculture	Pursuing position with Arkansas Game and Fish
115	2008	Natural Science			Housewife
116	2008	Natural Science-Life			Planning to enter Speech Pathology program
117	2007	Biology			Ph.D. program, University of Arkansas-Fayetteville (Biology)
118	2007	Biology			unknown
119	2007	Biology			Chiropractic School, Dallas TX
120	2007	Biology			Working in hospital lab at Dumas, AR
121	2007	Biology			unknown
122	2007	Biology			Dental School UT-Memphis
123	2007	Biology			unknown

124	2007	Biology			Radiological Technology Program, UAMS
125	2007	Biology			Arkansas Pollution Control and Ecology
126	2007	Biology		Natural Science	Graduated UAMS Nuclear Medicine Program in May 08
127	2007	Biology		Natural Science	University of Florida, College of Pharmacy
128	2007	Chemistry	Mathematics		D.O. program, Virginia Tech University
129	2007	Mathematics			Teaching math, Crossett School System
130	2007	Mathematics			MAT program/Teaching math, Dumas School System
131	2007	Mathematics			MAT program/Teaching math, Camden School System
132	2007	Mathematics			Teaching math, Monticello School System
133	2007	Mathematics			MAT program/Teaching math, Star City School System
134	2007	Mathematics		Collateral	Statistician for an insurance company
135	2007	Natural Science			Teaching at Bryant or Benton
136	2007	Natural Science			Completing Doctor of Pharmacy degree, University of LA-Monroe
137	2007	Natural Science			Employed at the Southeast Arkansas Educational Cooperative
138	2007	Natural Science-Life		Chemistry	Entering optometry school in Philadelphia, PA
139	2007	Natural Science-Life			unknown
140	2007	Natural Science-Life		Psychology	Graduate School at Arkansas Tech University in Student Services Adm.
141	2007	Natural Science-Life			Teaching science in Tucson, AZ and grad program in Sec Ed
142	2007	Natural Science-Life		Psychology	Gilead Counseling Center in Dumas, AR
143	2007	Natural Science-Physical		Agriculture	Part-Time at Bunge in quality control lab, looking for teaching jo

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) Is there anything you would change in your minor (if in Math and Sciences)?
- 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. More night class offerings.
- 9) Most say they have no changes. Not require minors to take the lab portion of the courses. Increase the number of upper level options in chemistry and physics.
- 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

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

For the most part. I could have used more engineering type courses with my current position.

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

At the time I didn't like it, but looking back, I love the fact that the faculty stayed on me until I succeeded. I could have been a drop out so easily if a couple faculty hadn't put me back on track.

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

Courses listed as "on demand" are bad. Add a chemist and get them on the schedule regularly

What changes do you recommend?

Do whatever you have to do to grow. That would improve everything.

Is there anything else you would like to add?

Name:

Major(s): Chemistry

Minor(s): Math

E-mail address

What are your plans after graduation?

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

Feel free to drop in for a visit. There's usually coffee available. Student organizations have tailgating at football games, etc... You are always welcome to join in. The newsletter is produced periodically. (Usually early Fall)
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

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

Yes

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

Everyone actually cares about you while you are here, and even afterwards they have contacted me to see if they can help me get a school to hire me so I can do the MAT program.

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

Boring part of the state

What changes do you recommend?

Do somethings that will make the place more student friendly

Is there anything else you would like to add?

I came here with no career plans and no direction. UAM helped me get on a path. I'm now a teacher, and I love it!

The following information is optional:

Name: Name removed

Major(s): Natural Science

Minor(s):

E-mail address

What are your plans after graduation?

Teaching science

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

Graduate Survey

School of Mathematical and Natural Sciences

P.O. Box 3480

Monticello, AR 71656-3480

Feel free to drop in for a visit. There's usually coffee available. Student organizations have tailgating at football games, etc... You are always welcome to join in. The newsletter is produced periodically. (Usually early Fall)

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

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

Absolutely. I have maintained a 4.0 GPA throughout the first year of pharmacy school, and am currently in the top ten of my class.

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

I was challenged, but I was helped to meet the challenge by some outstanding faculty members.

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

There are too many conflicting classes and labs.

What changes do you recommend?

Maybe the condition of the buildings on campus. The Science Center, some of the classrooms in BBC, and some of the classrooms in MCB are horrible.

Is there anything else you would like to add?

Dr. Taylor is awesome. He taught me so much. I have breezed through topics from organic chemistry that my classmates in pharmacy school struggle with.

The following information is optional:

Name: Name removed

Major(s): Chemistry

Minor(s):

E-mail address

What are your plans after graduation?

Pharmacy school at UAMS, then hopefully work in a retail pharmacy in the region.

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

Graduate Survey

School of Mathematical and Natural Sciences

P.O. Box 3480

Monticello, AR 71656-3480

Feel free to drop in for a visit. There's usually coffee available. Student organizations have tailgating at football games, etc...

You are always welcome to join in. The newsletter is produced periodically. (Usually early Fall)

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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
	05-06	06-07	07-08	08-09	09-10	10-11	11-12	Total	Mean	Mean
Biology	12	9	15	12	10	7	19	171	11.0	12
Chemistry	2	1	2	4	4	6	5	56	3.2	5
Mathematics	5	5	6	2	4	0	8	74	4.7	4
Natural Science*	4	3	7	2	8	4	12	45	4.5	8
Total	23	18	30	20	26	17	44	346	23.4	29
	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
Biology	6	10	11	13	6	6	9	4	12	10
Chemistry	3	4	3	3	5	4	2	2	4	2
Mathematics	5	2	5	1	4	5	5	5	3	9
Natural Science*	-	-	-	-	-	-	0	0	4	1
Total	14	16	19	17	15	15	16	11	23	22

*Natural Science degree added in 2001

Number of Majors per Class Level per year

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Allied Health											
Freshman	17	16	13	27	16	13	28	23	16	25	29
Sophomore	8	9	5	5	8	8	8	8	11	6	12
Junior	1	3	4	2	4	3	4	3	4	4	5
Senior	0	2	2	0	3	0	0	2	1	0	1
Total	26	31	24	34	32	33	48	41	41	35	47

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Biology											
Freshman	9	13	14	10	10	11	9	8	9	7	10
Sophomore	5	6	12	8	7	4	10	7	11	8	3
Junior	6	9	8	10	7	8	7	8	9	10	9
Senior	7	10	11	13	11	13	18	15	17	12	20
Total	27	40	45	44	38	39	47	39	52	37	42

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Chemistry											
Freshman	1	2	3	3	5	6	3	1	3	5	3
Sophomore	2	3	2	2	5	3	2	1	0	2	3
Junior	2	3	2	2	1	5	7	2	2	2	3
Senior	6	3	0	2	3	2	2	8	5	9	5
Total	11	12	8	9	14	19	14	12	12	18	14

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Mathematics											
Freshman	3	4	3	3	7	4	6	3	5	7	9
Sophomore	3	6	8	6	3	5	7	7	5	5	3
Junior	4	3	5	5	6	5	1	5	5	3	5
Senior	8	6	11	13	7	7	8	2	5	5	4
Spec/Post Bach	3	0	0	0	0	0	1	0	0	0	1
Total	21	19	27	27	23	22	23	18	22	20	22

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Natural Science											
Freshman	1	3	1	2	2	1	1	0	0	1	2
Sophomore	1	1	3	2	0	0	1	1	0	1	2
Junior	0	1	3	2	2	3	2	1	0	1	4
Senior	0	2	2	4	8	6	6	4	4	3	4
Total	2	7	9	10	12	10	11	7	5	6	12

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Pre-Engineering											
Freshman	9	8	6	4	7	11	7	5	10	6	9
Sophomore	2	3	1	1	2	3	3	2	2	2	1
Junior	0	0	2	0	0	0	1	1	2	0	0
Senior	0	0	0	0	0	0	0	0	0	0	0
Spec/Post Bach	0	0	0	0	0	0	0	0	0	0	1
Total	11	11	10	5	9	15	14	10	14	8	11

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Pre-Medicine											
Freshman	24	21	26	28	19	30	20	16	14	28	20
Sophomore	14	20	9	5	5	7	5	7	4	2	7
Junior	11	7	10	7	5	2	3	5	4	2	3
Senior	5	5	7	3	2	0	0	1	0	1	2
Spec/Post Bach	0	0	0	2	0	0	0	0	0	0	1
Total	57	54	53	45	36	60	49	49	41	33	33

<i>Fall term of year</i>	01	02	03	04	05	06	07	08	09	10	11
Pre-Pharmacy											
Freshman	15	10	11	13	14	14	16	15	8	14	15
Sophomore	5	11	3	6	9	8	3	9	7	3	8
Junior	4	3	9	2	4	6	3	3	4	6	3
Senior	3	4	3	3	1	4	0	1	0	0	3
Total	28	30	27	24	31	39	29	41	24	23	29

Total Unit	183	204	203	198	195	237	235	217	211	180	210
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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 15, 2010

{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 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). It appears that you lack only 2 elective courses to complete that degree; however you will likely need to take a 3 specific courses and one elective class in order to have enough upper level hours to meet the graduation requirements in Biology. 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 graduated, but not in area that originally planned.

December 12, 2010

Dear {Name}

I heard through the grapevine that you are selling real estate and not having a good time. I know you originally started your undergraduate career in pre-medicine and were doing very well when you were encouraged by your coach to change your major to something else in order to have fewer lab conflicts with practice. It saddened me to lose a student of your quality for this reason.

Would you be interested in coming back to pursue the pre-med career? With your GPA, I'm certain that you will have an excellent chance of being accepted to UAMS or even other programs in the region. Think it over, and if you are interested, let me know. I'll be glad to help you design a plan of coursework that will get you to the point of applying in one year, and entry into medical school in two years. It will require General Chemistry in summer school this summer and fairly heavy course loads with predominantly science courses for the next four semesters. Even if you are interested in taking these courses at another university, I'd love for you to fulfill your dream. There are other options in the medical field if you are interested. Let me know if I can help in any way.

Morris