

Annual Assessment Report

2015-2016

School of Mathematical and Natural Sciences

This assessment report is available through the School homepage at
<http://www.uamont.edu/pages/school-of-mathematical-and-natural-sciences/resources/>

July 2016

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 in the display case near the front entrance to the Science Center. They will also be posted on the UAM Math and Sciences website on the Departmental Resources page at: <http://www.uamont.edu/pages/school-of-mathematical-and-natural-sciences/resources/>

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.

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 or other elements that are unrelated to the student's ability to successfully complete the learning objectives at the course level. In most

cases, a large percentage of the course grade is based on performance on exams. The level of difficulty of questions on exams is comparable to questions found in supplied test banks, end of chapter problems, and in chemistry the ACS Standardized Final Exams. The textbooks used in most of our courses are the industry standard text for that course. Some math courses also use an in-house written workbook as a supplement. 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. The American Chemical Society is not an accrediting body; however, they offer recommendations on chemistry curricula, and even give approval if certain standards are met. Our teaching loads, library holdings, and minimal amount of lab equipment for teaching and research prevent us from receiving their approval. Even though our chemistry program is not ACS approved, their internationally recognized model is followed as closely as possible.

Pre-tests and Post-tests

For the past few years, several courses are using pre-test and post-tests. The questions asked on the pre-test are 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
Intro to Biological Science	53	15	8.7	10.3
Comparative Anatomy	10	15	5.5	9.4
Evolution	31	15	5.32	9.10
Mammalogy	20	15	5.4	9.3

On the first class day of the Fall 2015 semester and the Spring 2016 semester, a pre-test was administered to the students in the Introduction to Biological Sciences classes taught by John Hunt at the University of Arkansas at Monticello. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Biology. 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. (A copy of the questions is included at the end of this report.) 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.

Only students who completed both the pre-test and post-test are included in the results given here. There were two separate sections, one each in the Fall and Spring. For the purposes of this report, the two sections were combined. Average score on the pre-test was 8.7 out of 15, or 58.3% (n = 53, range 2-14, standard deviation 2.55). Average score on the post-test was 10.8, or 68.9% (n = 53, range 2-15, standard deviation 2.26). Of those who took both pre-test and post-test, 39 registered an improvement on the post-test (n = 53, average increase 1.6 questions, range -3-7, standard deviation 2.05). Average percentage change in score was 26.2% (n = 53, range -27.3-166.7%, standard deviation 40.5%). Six students actually did worse on the post-test than on the pre-test.

This is the third year that this type of assessment has been used in the Introduction to Biological Science class. Results seem to indicate that many of the objectives of the class are being met. The instructor

will use the assessment again next year. After several years of results have been collected, the instructor will analyze results of individual questions to determine whether changes in the presentation of material need to be made to make sure that all concepts are being covered adequately. It should be noted that this is a freshman class, and many of the students in the class clearly came directly from high schools with good biology programs. As is indicated by the wide variation in pre-test scores, some of the students were not so well-prepared. It should also be noted that there were several students were registered for one of the sections included, and failed to take either the pre-test, post-test, or both. It is unclear what effect this had on the obtained results.

On the first class day of the Fall 2015 semester, a pre-test was administered to the students in the Comparative Anatomy class at the University of Arkansas at Monticello. 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.

Only students who completed both the pre-test and post-test are included in the results given here. Average score on the pre-test was 5.5 out of 15, or 36.7% (n = 10, range 3-9, standard deviation 1.96). Average score on the post-test was 9.4, or 62.7% (n = 10, range 5-15, standard deviation 2.95). Every student in the class registered an improvement on the post-test (n = 10, average increase 3.9 questions, range 1-8, standard deviation 2.28). Average percentage change in score was 79.1% (n = 10, range 12.5-200.0%, standard deviation 54.7%).

This is the fourth year that this type of assessment has been used in the Comparative Anatomy class. Results in 2015 were roughly equivalent to those obtained in the preceding three years. Results seem to indicate that many of the objectives of the class are being met. The instructor will use the assessment again next year. After several years of results have been collected, the instructor will analyze results of individual questions to determine whether changes in the presentation of material need to be made to make sure that all concepts are being covered adequately.

On the first class day of the Spring 2016 semester, a pre-test was administered to the students in the Evolution class at the University of Arkansas at Monticello. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Evolution. 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. (A copy of the questions is included at the end of this report.) 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.

Only students who completed both the pre-test and post-test are included in the results given here. Average score on the pre-test was 5.32 out of 15, or 35.5% (n = 31, range 3-9, standard deviation 1.42). Average score on the post-test was 9.10, or 60.7% (n = 31, range 5-14, standard deviation 2.18). All 31 students registered an improvement on the post-test (n = 31, average increase 3.8 questions, range 1-7, standard

deviation 1.87). Average percentage change in score was 76.8% (n = 31, range 16.7-175.0%, standard deviation 43.8%).

This is the third year that this type of assessment has been used in the Evolution class. Results seem to indicate that many of the objectives of the class are being met. However, results for 2015 and 2016 were not as good as those from 2014. This is in part due to the fact that several days of classes was missed due to weather in both 2015 and 2016, so that not all material covered on the assessment tests was covered. The instructor will use the assessment again next year. After several years of results have been collected, the instructor will analyze results of individual questions to determine whether changes in the presentation of material need to be made to make sure that all concepts are being covered adequately.

On the first class day of the Fall 2015 semester, a pre-test was administered to the students in the Mammalogy class at the University of Arkansas at Monticello. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Mammalogy. 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. (A copy of the questions is included at the end of this report.) 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.

Only students who completed both the pre-test and post-test are included in the results given here. Average score on the pre-test was 5.4 out of 15, or 36.0% (n = 20, range 2-8, standard deviation 1.82). Average score on the post-test was 9.3, or 62.0% (n = 20, range 7-14, standard deviation 1.69). Every student in the class except one registered an improvement on the post-test (n = 20, average increase 3.9 questions, range 0-6, standard deviation 1.80). Average percentage change in score was 91.4% (n = 20, range 0.0-300.0%, standard deviation 70.6%). One student scored the same on the post-test as on the pre-test.

This is the second year that this type of assessment has been used in the Mammalogy class. Results seem to indicate that many of the objectives of the class are being met. The instructor will use the assessment again next year. After several years of results have been collected, the instructor will analyze results of individual questions to determine whether changes in the presentation of material need to be made to make sure that all concepts are being covered adequately.

In Biology 2143, General Botany, a self-evaluation was given in which the students assessed their knowledge in four major areas of plant biology. The format was multiple choice, with possible responses being a) No knowledge, b) We covered the topics in high school or another class, but I can't remember, c) I have enough knowledge to pass a multiple choice or word bank test, d) I have enough knowledge to do well on an essay test, or e) I have enough knowledge so that I feel comfortable tutoring my roommate or sibling.

While this is similar to a pre-test and post-test to measure student performance, it is somewhat different because it measures the confidence level of the student to apply the knowledge learned in this particular course. Some of the faculty are even considering using both the survey and a pre/post-test so that results can be compared.

Because of scheduling conflicts, the make-up of the students in this course often varies from fall to spring terms. Often, the fall term has more students from Forestry and Natural Resources, while in the spring term there are more biology majors mixed in with those students. The major difference in the two groups is the

biology majors have most likely taken Principles of Biology I and Principles of Biology II prior to taking botany, while the Forestry and Natural Resources students have not been required to take a prerequisite course prior to botany. A second factor is that many of the biology majors are sophomores, or possibly even juniors while the Forestry and Natural Resources students are sometimes at the freshman level. The following tables show the questions and the results for the two botany classes taught during the 2014-15 academic year.

General Botany-Spring 2016

Self-evaluation questions 30 responders Spring 2016		a) No knowledge	b) We covered in high school or another college class but don't really remember	c) I have enough knowledge to pass a multiple choice or word bank test	d) I have enough knowledge to do well on an essay test	e) I have enough knowledge so that I feel comfortable tutoring a roommate or sibling	Results
How would you assess your overall knowledge on the following topics:							
plant taxonomy; generic name and specific epithet; cell structure of prokaryotic vs. eukaryotic cells; structure and function of plant cells; and simple vs. complex plant tissue	Pre-test	0%	37%	43%	13%	7%	80% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0%	0%	23%	40%	37%	
transport of nutrients, minerals, and water in vascular plants; photosynthesis; light reactions; carbon fixation, RUBISCO; C ₃ plants; C ₄ plants; and CAM plants	Pre-test	10%	43%	33%	10%	3%	83% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0%	0%	30%	33%	37%	
meiosis; mitosis; gametic, zygotic and sporic life cycles; characteristics and evolution of photosynthetic protists (algae); and characteristics and evolution of fungi and lichens	Pre-test	7%	33%	53%	3%	3%	83% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	40%	37%	23%	
characteristics and evolution of bryophytes (non-vascular plants); lycophytes; ferns; and fern allies	Pre-test	37%	57%	7%	0	0	97% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	37%	37%	26%	
characteristics and evolution of gymnosperms and angiosperms; flowering plant production (double fertilization); simple, aggregate and multiple fruits; seed development; plant and animal co-evolution; plant reproductive strategies; ethnobotany; and economic botany	Pre-test	40%	27%	27%	0%	0	90% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	10%	43%	43%	

General Botany-Fall 2015

Self-evaluation questions 42 responders Fall 2015		a) No knowledge	b) We covered in high school or another college class but don't really remember	c) I have enough knowledge to pass a multiple choice or word bank test	d) I have enough knowledge to do well on an essay test	e) I have enough knowledge so that I feel comfortable tutoring a roommate or sibling	Results
How would you assess your overall knowledge on the following topics:							
plant taxonomy; generic name and specific epithet; cell structure of prokaryotic vs. eukaryotic cells; structure and function of plant cells; and simple vs. complex plant tissue	Pre-test	5%	52%	33%	5%	5%	88% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	24%	40%	36%	
transport of nutrients, minerals, and water in vascular plants; photosynthesis; light reactions; carbon fixation, RUBISCO; C ₃ plants; C ₄ plants; and CAM plants	Pre-test	9%	55%	31%	5%	0%	90% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	39%	32%	29%	
meiosis; mitosis; gametic, zygotic and sporic life cycles; characteristics and evolution of photosynthetic protists (algae); and characteristics and evolution of fungi and lichens	Pre-test	5%	67%	21%	5%	1%	93% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	33%	33%	33%	
characteristics and evolution of bryophytes (non-vascular plants); lycophytes; ferns; and fern allies	Pre-test	62%	33%	5%	0	0	98% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	40%	43%	17%	
characteristics and evolution of gymnosperms and angiosperms; flowering plant production (double fertilization); simple, aggregate and multiple fruits; seed development; plant and animal co-evolution; plant reproductive strategies; ethnobotany; and economic botany	Pre-test	36%	45%	19%	0	0	95% of the students felt that their level of mastering the topics indicated had improved.
	Post-test	0	0	21%	45%	33%	

Last year, in comparing the two classes from different terms, it is clear that the initial level of confidence was much higher among the spring term students. This year, that trend isn't seen. We are trying to get Biology majors into Botany earlier than in the past. It appears from this data that we are probably getting a good mixture of majors and non-majors in both courses. Both classes confidence levels improved dramatically when comparing the pre/post survey results.

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. A nationally normalized 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 2015 term, the ASSET test was given to all Intermediate Algebra sections as a required component of remedial math assessment. Some took the course as a 16 week course, and others took it as an 8-week course during the first half of the term, and others took it the second half of the term. Unfortunately, 23 students took it both terms. In total, 286 students enrolled in Intermediate Algebra. 209 of those students took the exam. 91 of 209 (43.5%) students taking the exam passed at the level equivalent to a 19 ACT score. 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. As the number of students coming back to take the exam in a "hail Mary" effort increases, the pass rate continues to drop. There were 71 students who passed the course with a grade of C or higher. Of these 71 that passed the course, 53 passed the ASSET exam; however all 71 of these students were allowed to move on to College Algebra by virtue of the course grade. Of the students that took the ASSET exam and failed the course, 38 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, 113 of 286 (39.5%) were allowed to progress to college-level mathematics courses, which is an improvement over the 29% two years ago, and 34.5% last year. Students in the 8 week courses seemed to fare better than those in the 16 week courses. In term 8W1, 19 of 79 initial enrollees passed the course and 35 of the 70 that took the exam scored a passing score on the exam. Overall 38 of the 79 students (48.1%) were successful in that term. In the 8W2 term 65 students were enrolled, and 51 took the ASSET exam. Thirty students (46.1%) were successful, with 24 passing the course with a C or higher and 22 passing the exam. Of those that took the course both terms, 7 of the 23 were successful with the second attempt. Five passed the course, and seven passed the exam.

ASSET Exam Results (Prior to Fall 2013, may include Crossett and McGehee)

Term	# enrolled	# taking exam	# passed	% taking test that passed	passed test w/o passing course	passed course w/o passing exam
Spr 16	132	75	35	46.7	7	15
Fall 15	286	209	91	43.5	38	22
Spr 15	132	76	32	42.1	13	10
Fall 14	240	136	69	50.7	14	12
Spr 14	150	84	45	53.6	12	7
Fall 13	224	98	52	53.1	19	12
Spr 13	216	107	69	64.5	21	13
Fall 12	327	167	95	56.9	42	20
Spr 12	242	122	83	68.0	15	12
Fall 11	266	143	93	65.0	32	8

In the Spring 2016 term, 132 students took Intermediate Algebra for a grade at the main campus. Of the 132 students, 29 took the course in the 8W1 term, 18 took the course during the 8W2 term, leaving 85 taking the course as a 16 week course. Overall, 75 of the 132 enrollees took the ASSET exam. There were 35 that passed the exam with an equivalent of 19 on the ACT. There 43 students that scored a C or higher in the course. 28 students passed both the exam and the course. Overall, there were 50 students (37.9%) allowed to progress to college level math. This was up from 32% from Spring 2014, but somewhat lower than Fall 2015.

Again, the 8-week courses were more successful than the 16 week courses. In 8W1, 25 of the 29 enrolled took the exam and 15 passed the exam. There were 15 that also passed the course with a C or higher, with 11 passing both the course and the exam. Overall, there were 19 (65.5%) out of the 29 students originally enrolled that were successfully allowed to move onward to a college math course. In 8W2, only 7 of the 18 enrolled took the exam, and only 3 passed it. Six students passed the course with a C or better, with 3 passing both the test and the course. This gave a total of 6 (33.3%) successful students out of the 18 originally enrolled.

One disturbing fact from the data above is the large number of students who never complete the course. Some drop, some just walk away and receive an F. In the Spring, only 56.8% of the original enrollees took the ASSET end of course exam. In the 8-week courses, especially in the first 8 weeks of the semester, a much higher percentage completes the course 25/29 (86.2%) took the exam.

Using data from the ASSET exams, faculty continue to make changes to the topics covered in Introduction to Algebra, Intermediate Algebra, and College Algebra. All of the courses are using in-house written workbooks which serve as the primary textbook for the course, and all use an online homework and assessment package that is closely aligned with the workbook. Trigonometry and Survey of Math and other courses are now using the in-house published workbooks along with an online homework package.

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. For the second year in a row on the General Chemistry standardized final exam, UAM students finished 2 questions below national average. Although it is below national average, we are fairly pleased with our results since we are being compared to ACS approved programs, and several that use the exam are prestigious private institutions with high admissions standards. Some colleges only give the exam in courses designated for chemistry majors and honors students. There were several UAM students that scored above the 75th percentile nationally; however, several of the non-science majors taking the course didn't score well on the comprehensive final, which brought the average down.

This year's Organic Chemistry class' mean and median scores remain very similar to the national average. A handful of students in the class scored above the 80th percentile nationally. 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. It is also noted that the faculty thought that this year's exam was much more difficult than exams in the past. This is supported by the fact that the national average reported by the ACS dropped approximately 1 point compared to previous versions of the 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 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 15-20

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. Fewer universities are giving the exam now than in the past because of this trend. At UAM, scores have decreased similar to the national trend. Not only has our number of correct answers dropped, but our percentile ranking has dropped as well. Since 2008, the scores have been in the 40th to 45th percentile range, nationally. Again this year, the percentile ranking is not known since the exam was a new exam provided by the ACS; however, this year's students averaged slightly more correct answers than last year. Without standardized data for comparison, it is impossible to compare results. This group had several students that performed above the 80th percentile level based on scoring averages in the past. 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 two traditional chemistry majors have graduated in the past five years. The bulk of the students taking the General Chem I and II sequence are biology majors and agriculture majors. The chemistry faculty continue to note 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. One of these packages was adopted as an optional purchase so that students can do homework on-line and get immediate feedback. Two years ago, the Sapling Software package was used for online homework and assessment. In general, most of the students did not like the online homework. Almost every student indicated they preferred the pencil and paper versions. Last year, a shorter, traditional paper homework was given on a daily basis. When paper homework was given, more than 90% of the papers were turned in for grading. The online homework rarely had 50% of the students making an effort. Even though there was not an obvious improvement in student performance, there was certainly an improvement in student satisfaction. Some students like the online homework because of the immediate feedback provided; however, a much larger percentage of the students disliked the online homework because of problems in getting answers in the correct format and errors on the homework website.

Even though many of the students score at or below national average on the ACS final exam, there are several that score very well on the exam. Many of these students continue to be successful in future chemistry courses and continue onward to professional programs in medicine, pharmacy, dentistry, physical therapy, or graduate school.

Admissions Exams

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

During the past year, three students took the Medical College Admissions Test (MCAT) and two students self-reporting overall scores back to UAM. This year, the MCAT Exam changed to a totally new format and scoring system. The new exam has a social science section on the exam. According to AMCAS, Intro to Psychology and Intro to Sociology are sufficient background to prepare for the new section; however, all three of the students indicated that it was their lowest section by far. The two that reported scores told that they scored single digit percentiles on that section of the exam. The third person would not give their scores, but they indicated that were similar to the other two. The exam still has sections in biological sciences, physical

sciences, and verbal. Each section is now scored in the range of 118 to 132 with 125 being average for each section, making an overall of 500 an average score. One student reported the first exam overall score was a 495 and their second attempt was a 499. The second student reported a 493 overall score. This was disappointing since both students were high GPA students that we expected to perform well on the exam. Only one student was accepted this year, and it was a student from last year that had taken the old MCAT exam. Other colleges from around the state have also indicated that their students aren't doing as well on the new MCAT as the old version. Every advisor from other colleges that I have talked with have also indicated that they are taking a beating on the Social Science section of the exam. While this year's applicants from UAM were not as strong as in the past, we fully expected to get one or possibly both of the 2016 graduates into a medical school or D.O. program in the future. Both of those students went against the advice of their advisor and applied to only one medical school and were not accepted. Both are saying they will re-apply for 2017 admission; however, MCAT scores will likely determine if they are accepted. All the students indicated they did not finish most sections of the MCAT exam on their first attempts.

Five students took the PCAT exam in the past year and self-reported all or partial scores back to UAM. The scores range from to 12th to 84th percentile. Two of the five scored well above national average, while three had composite scores below national average. The three lower scoring students took the PCAT multiple times and used "superscoring" to achieve the minimum scores needed for admission. Five applied to pharmacy school, and all five were accepted. Two applied to and were accepted at multiple universities. The exam has sub-scores for verbal, biology, reading comprehension, quantitative ability, and chemistry. There is also no calculator allowed on this exam even though calculations are done in both the quantitative and chemistry sections. Many UAM students struggle with the calculations when not allowed to use a calculator. Typically, UAM students score highest in chemistry or biology sections of the exam. For most UAM students, the quantitative, 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. Over the past six years, UAM students have averaged 44th percentile on the verbal ability, 52nd percentile in biology, 41st percentile in reading comprehension, 37th percentile in quantitative ability, and 53rd percentile in chemistry. This year's group averaged 32nd percentile in verbal, 47th percentile in biology, 31st percentile in reading comprehension, 31st percentile in the quantitative section, and 49th percentile in chemistry. Two students did very poorly on the exam on the first attempt. Both raised their scores enough on later attempts to the level of being acceptable. We are not pleased with this group's sub-scores in all areas, despite the fact that all five were accepted. With the acceptance of 5 students out of 5 applying, 39 of 40 applicants over the last eleven years have been accepted into a college of pharmacy. Only 37 of the students actually attended pharmacy school, and to the best of our knowledge, 36 have completed their program, or they are on-track to complete their degree. One student accepted in 2015 is not planning on returning this fall.

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 at another university told him that UAM students continue to do quite well. Typically UAM students scored near the top of the class on the organic chemistry evaluation exam that is given early in the term. This year, one student self-reported that she scored a 98% on the exam, while the class average was in the lower 60's. They typically do very well on the biochemistry topics; however, one student in the P1 class struggled. They are very pleased with the overall science background of the UAM students. They are especially pleased with the balance of chemistry and biology knowledge they possess. One of the UAM P1 students at UAMS was at or near the top

in every class. They typically do not indicate which students do well, so it is impossible to infer what courses at the undergraduate level led to their success.

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. Students must write a research paper and do an oral presentation, either locally or at a professional meeting. Biology faculty grade all students in Biology Seminar. Chemistry faculty are involved in the grading of the papers and oral presentations in Advanced Lab Techniques.

In Mathematics, seven 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. All three students did exceptionally well in all aspects of the course. All three students from the spring term have been hired by local school districts to teach mathematics; however, two were late hires and are now scheduled to take the Praxis exams and apply for the UAM Master of Arts in Teaching program. Two of the four students from the fall term were asked to re-do their oral presentation. The second attempt went very well, and all students exceeded the expectations of the faculty. Over the past eleven years, 39 of the 48 math graduates have entered a graduate program of some sort.

One mathematics major, Nicole Nichiniello, presented a poster in physics at the Arkansas Academy of Sciences, and won second prize in the physics poster competition. She also presented at the UAM Student Research and Scholarship Forum. Nicole has been accepted into the Ph.D. program in Biophysics at the University of Arkansas. Her presentation is shown below:

Name	Meeting	Title
Nicole Nichiniello	Arkansas Academy of Science, Fayetteville, AR, April 2016 and UAM Student Research and Scholarship Forum, Monticello, AR, March 2016	SIMION Model of Electrostatic Positron Storage Ring

This year, Advanced Lab Techniques was very large, partially due to the fact that it was not taught in the previous year. Seventeen enrolled in the course, and one student withdrew by midterm. Of the remaining 16 students, two did an outstanding job in all aspects of the course, including their written paper and their oral presentation. Six others performed at the satisfactory or slightly above average level. The seven remaining students struggled in one or more of the segments of the course. Four passed with a D, and two failed. The two students that failed this requirement switched their major to Bachelor of General Studies and completed their degree. One student accepted the opportunity to give her oral presentation a second time. Her second performance was orders of magnitude better than her initial attempt, and her grade was raised to a C.

Five 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. Some students did similar presentations at multiple meetings. All demonstrated successful accomplishment of student learning outcomes. Two of the presentations won awards. Two of the students have been accepted into chemistry Ph.D. programs

(Autumn Webb, LSU and Cynthia Robinson, UA). Don White, III, is completing a summer internship at the University of Colorado. These positions are extremely competitive. These students' general academic performance, and performance in their research areas have made them very successful in getting these highly sought after positions. The table below shows the meetings and titles of the presentations.

Name	Meeting	Title
Don White, III	2015Arkansas INBRE Research Conference, Fayetteville, AR, 2015 (3 rd place poster presentation)	Ordering Practices for Initial Out-Patient Echocardiograms by Pediatric Cardiologists (from summer internship at Arkansas Children's Hospital
Don White, III, Beth Justice, and Drake Palazzi	2015Arkansas INBRE Research Conference, Fayetteville, AR, 2015 and NASA-Arkansas Space Grant Consortium Annual Symposium and Arkansas Academy of Sciences, Fayetteville, AR, April 2016. (2 nd prize poster presentation)	Determination of Fatty Acid Content in Algae
Cynthia Robinson & Autumn Webb	NASA-Arkansas Space Grant Consortium Annual Symposium, Hot Springs, AR, April 2016	Red Cabbage inhibits Nitrate Reduction in Celery Juice during Storage
Cynthia Robinson & Autumn Webb	NASA-Arkansas Space Grant Consortium Annual Symposium, Hot Springs, AR, April 2016	Green Cabbage inhibits Nitrate Reduction in Vegetable Juices

Biology Seminar is used as the capstone course for the Biology major. Fourteen students enrolled in the course in the 2015-16 academic year. Five 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. Three students failed the course because they simply would not turn in the required work. One student received a D because he was severely late in turning in all assignments, and was even allowed to give his seminar during finals, weeks after the due date. The remaining six students performed at the acceptable level. Four students were asked to do major re-writes of their paper. All eventually reached the acceptable level on their research paper. Several gave very disappointing oral presentations. Both the chemistry and biology faculty were very displeased with the oral presentations involved with their seminar courses. All students have previously taken an oral communications course at UAM, but several indicated that this was their first time to ever give a speech in front of people.

Four biology majors were involved with research projects that ended with the presentation of their results at professional meetings. The biology faculty felt that all students displayed very good to excellent knowledge of the topics and performed exceptionally well in preparing the poster. While many of the students involved with research are underclassmen and will be returning, the one graduating senior has been accepted into the UAMS College of Pharmacy (Seth St. John).

The presentations are listed below:

Name	Meeting	Title
Alice Cardona-Otero	Arkansas Academy of Science, Fayetteville, AR, April 2016	DNA Sequence Analysis of Freshwater Eustigmatophyceae from Diverse Locations Reveals Exciting New Taxa
Seth St. John, Devon Wray	Arkansas Academy of Science, Arkadelphia, AR April 2015 and Arkansas INBRE Conference, Fayetteville, AR, November 2015	Analysis of a Ribosomal Protein Gene in Tumor Development
Miguel Taylor	LSU-Shreveport Scholars Forum, Shreveport, LA, February 2016 and UAM Student Research and Scholarship Forum, Monticello, AR, March 2016	Comparison of Insectivory by Birds in Urban and Rural Habitat

Overall, the School of Math and Sciences had numerous research projects involving students. From these projects there have been 13 professional presentations by students, 3 publications in refereed journals, and 7 grants that had contributions from student researchers. These students are recognized for being excellent students and are highly sought after for graduate programs. Three Math and Science graduates have been accepted into Ph.D. programs with all receiving assistantships. The biology/biochemistry double majors continue to be exceptionally successful with three students being accepted into pharmacy school. Three Mathematics graduates have been accepted into the post baccalaureate teaching preparation programs, and one was accepted into the graduate program at the University of Arkansas.

4. 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 schools that host 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. With the number of graduates being very small, it is very difficult to see trends. We try not to become overly excited when a single student does something exceptional, nor do we think the program is declining if a student stumbles along the way. We do pay close attention to what former students tell us about why they did well, or why they struggled in a particular area.

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. With 1 out of 3 accepted into medical school this year, UAM has 26 of 29 accepted in the past 11 years. One of the three that were unsuccessful in the past has been accepted into the Ph.D. program in Chemistry at the University of Arkansas. The other two are planning to re-apply to medical school for the 2017 class. In 2015-16, 5 out of 5 students were accepted into pharmacy programs. The pharmacy acceptance rate over the past 10 years is 98% (39 out of 40). We feel that every applicant that has truly deserved to be admitted has been, and even a couple that were marginal have been admitted. This year, our one applicant (a 2013 graduate) to dental school scored well above national average on the DAT exam, and was recently accepted to the MeHarry Medical School College of Dentistry. See Appendix B for initial placement information of Math and Science graduates and other acceptances from the current year.

The School requests all graduating Math/Sci. students to visit the dean to have a brief exit interview on their experiences at UAM. While only a small number of students take advantage of this opportunity to provide input, there are many common comments among the interviewees. This year, 8 students completed the survey. Some students were critical of the condition of the Science Center. Three students mentioned the condition of equipment and computers. The general responses toward quality of teaching are outstanding. Essentially every person responding felt that their level of preparation for their upcoming graduate program, professional school, or job was outstanding. Most were very pleased with their post-graduate positions they had received. To see the exit interview/graduate surveys completed within the last twelve months, go to Appendix C for student responses.

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. This year, no graduate surveys were returned, even though several were sent to students that reconnected with us. Several former students were more than willing to provide verbal comments during telephone or face to face conversations. A former chemistry student discussed his time at UAM while gathering information for the program review. He shared his views on the strengths and weaknesses of the chemistry curriculum, but was most critical of the age of equipment and exposure to modern techniques. This is one reason we started the Advanced Lab Techniques course a few years ago. We can expose students to the more modern techniques, even though we don't have the high dollar equipment needed for those techniques. The pharmacy and medical students openly praise Dr. Taylor's teaching in organic and biochemistry, and several also spoke highly of Hunt, Sims, Fawley, Abedi, Fox, and Williams.

Even though it is more informal, we do listen to current student evaluation 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. We haven't had many advising errors in recent years. 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 in their professional program and as their major. This year, more emphasis was put on getting students listed properly in WeevilNet. We held a pre-professional studies meeting, and invited everyone that was listed as our major, and sent out an open invitation to the rest of campus. As a group, we talked about the majors in our unit, but then split into groups based on their pre-professional program and held more detailed discussions. We plan to do this again this fall. We will likely hold more than one of these meetings to make sure that we reach all that desire to come to the meeting. We will likely do it again during the spring term.

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 a third year student being the top in the class. They also shared some anecdotal stories about our students having to step out of the room during the early stages of gross anatomy lab. Obviously, it is a disadvantage that our students don't see human cadavers in their undergraduate training, but that is something we won't likely ever do. It simply isn't practical. The UAMS and Harding University Colleges of Pharmacy each provide similar information about our students. Harding reported that all of our students had a good year and is extremely pleased with the UAM student's performance. UAMS representatives said that for the most part, UAM students were doing fairly well; however, they were very concerned about one student, but felt it was life creating issues that were influencing her studies, not lack of preparation. That one student has since left the program and is trying to decide whether to return or chose a different field of study.

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. Again, it was recommended that our chemistry students get more experience in scientific writing, and use of chemical literature. In the past, we responded to that recommendation by putting more emphasis on the research paper portion of Advanced Lab Techniques. With only one or two per year attending graduate school, that was probably not the best place to implement that change. In the future, we will selectively encourage those that are planning on graduate school to do more work with the electronic reference materials. 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. This year, we had the first Math and Science majors choose this as a minor, and we have had several students take courses from this minor as electives. Several of the students have indicated that they feel this better prepares them for the MAT program.

Advanced Calculus or Real Analysis (similar course, different name) was recommended by recent program reviewers. Last fall, an Advanced Calculus course was offered as a special topics course. The course was approved by Curriculum and Standards for approval as a permanent course, and is a required course for the mathematics degree. The unintended result of this action was that several students that were once considering a math degree are now considering switching to a Teaching and Learning major, and simply taking the hours in mathematics to serve as an emphasis area. While the Advanced Calculus course is useful to the math majors that plan to attend graduate school, it probably isn't that helpful to those that do the math degree as a pathway into the MAT program. With most of the majors going that path, we are considering making the Advanced Calculus an elective course, and advising students into that course if they plan to attend a graduate program in mathematics.

5. 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.

The General Chemistry I and II classes' out of class assignments are still being improved. Initial changes last year appear to have been successful, and student evaluation comments were very positive in that area. There

were certain gaps that need to be filled with those assignments this year. The faculty in those courses will assign problems that cover those gaps assigned in last year's classes. Instructional videos are also being considered to help with providing additional content related to some of the more complicated topics.

Last year, all faculty in Math and Sciences implemented selected portions of the First Four Weeks initiative that was proposed by the Provost. Many of the best practices listed were already used by most of the faculty in Math and Sciences; however, there were hopes that the adoption of additional best practices will improve first year retention. Even though we don't have enough data to say whether those initiatives were helpful or not, we feel that they may have been helpful and will continue to use many of the items recommended. We will also look for other items that may be incorporated into our plan for this term.

We will continue to do group advising sessions; however, we will likely break the group down into smaller groups so that we can be more specific toward the needs of the smaller number of majors in the allied health fields. This worked especially well for the pre-professional students. 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 will provide a program for our students. The Sigma Zeta Math and Science Honor Society students are also planning a student advising session to help students plan their path to professional school or a graduate program.

Faculty that teach developmental math are doing almost everything they can to improve the success rate in their courses. They are writing workbooks for the students to use, they are demonstrating ALEKS and WEBASSIGN in class, they are holding afternoon help sessions, they are giving practice exams, they are giving unlimited attempts on homework without deadlines. These measures simply aren't changing the success rate that much because students are not taking advantage of the extra opportunities. In the spring, we may try a 5 contact hour developmental course that will require students to attend additional class time to do homework and get additional help. Discussions with Academic Affairs are ongoing on this topic, and there are details that must be worked out before promising that this class will be taught. If it comes to fruition, some of the remedial mathematics faculty are planning to try to use some class time to take students to the computer lab and actually work with them on ALEKS. There are hopes that it will give the students the background to be able to log in on their own time and complete the needed work.

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

Remedial mathematics has been a difficult area on this campus to say the least. This year on the main campus, just over 19% of the Intro Algebra students passed the course with a C or higher. The 8-week course pass rates were slightly higher than those in the 16 week courses. Typically, these classes have students with poor attitudes, no motivation, poor study skills, and even poor attendance. With the lack of effort from the students, it is likely that the practices used by the instructor are not going to be successful. The online homework and assessment tools that have been adopted in the last several years, such as ALEKS (Assessment and Learning in Knowledge Spaces), MyMathLab, and WebAssign have done little to help the success rate; however, because

these programs document the amount of time actually spent working problems and getting online tutoring, it supports the claims by the faculty that the students aren't putting in the effort. The faculty have written, and revise each semester, a workbook that closely follows the lecture. Students can literally follow the problems worked in class in the workbook. It was hoped that this would allow the students to focus on what the teacher is saying instead of writing so much material down. This really hasn't helped as much as hoped. When observing the courses, very few students are paying attention at all, and many have their attention focused on their telephone. Every faculty member in the department has proposed ideas that would hopefully motivate the students therefore lead to more effort. It is clear that the problem with this level of remediation isn't the understanding of mathematics, it is more about motivation. We must help the students understand that it is necessary to have the focus, the work ethic, and the determination to do what is needed to be successful. Increasing contact hours may help. It is being considered at this time.

In Intermediate Algebra, the students are required to take the ASSET test as the end of course final exam. The course pass rates have not increased significantly with the adoption of the online homework; however, a higher percentage of students are attempting, and some are passing the end of course exam without passing the course. 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, which is almost identical to the previous year. Again, the success rate in 8-week courses is slightly higher than those in the 16 week courses, so we will encourage students to do the 8-week courses whenever possible. 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. Similar to Intro Algebra, we feel that a large part of this is due to lack of student effort. This is confirmed when reviewing 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 on occasion, log very little time on ALEKS, and simply quit coming to class at some point in the semester. The University's retention plan will now require that roll be taken every day in every class. There are hopes that this leads to better class attendance, and more participation. Faculty are consistently trying new ways to get the students to participate in class, and practice the material out of class. During the past three semesters, we have had a faculty member assigned to the tutor lab for several hours per week, in addition to the normal student tutors. The students that choose to use this service have been very successful (self-reported); however, only a small percentage of the students take advantage of this situation. The faculty are revisiting the mandatory lab time, or required tutoring for these classes. The idea of a 5 contact hour course is being studied.

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. This requires changes in workbooks and the ALEKS package to match the coverage. Every change that is made in these documents and packages is in an attempt to improve student success.

The Survey of Math courses have been using an online homework system, My Math Lab, which provides immediate feedback. The workbook that was developed for the course seems to be well received by the students, and the faculty are revising it between terms to make it even better. The course doesn't have a large

enrollment, despite the fact that it will fulfill the college math requirement for most of the non-STEM majors on campus. We strongly feel it is more appropriate than College Algebra. Recent discussions with Dr. Doss have reinforced the idea that we need to initiate a campaign to get more students into this course instead of College Algebra.

The College Algebra students tend to be fairly successful, with typically 50% passing. We would love for that to increase. According to our statistics, and those from ACT, students really aren't ready for College Algebra with a 19 on the math portion. This fall, we are doing a special topics section called, "College Algebra with Review." This course will be a 3 credit hour course, but will meet 5 days per week. This will allow time to have remediation on topics as needed, and more importantly, it will give the instructor time to work with the students on homework and practice problems. Our target audience for this class are students with a 19-21 ACT in mathematics; however, we are willing to accept any student that feels they need the extra attention.

Last year, we considered bringing more topics into Chem I from Chem II in order to minimize the difficulty gap between the two courses. We tried to cover an additional chapter (Chapter 10) in the Fall 2014 term; however, the faculty felt that they were simply moving too fast for the students to be able to grasp the material. In the Fall 2015 term, we felt that it might be more appropriate to move a shorter, easier, topic into Chem I. Last fall, we pulled Nuclear Chemistry from late in the second semester to the first semester. It was very successful. It didn't change the difficulty level of Chem I very much, it is a short topic so it didn't affect the time line greatly, but it certainly allowed Chem II to be taught at a slightly slower pace than in the past. Of course, the unintended result of this change is that it removes one of the easier topics from Chem II, and therefore probably lowered the overall grades a small amount. Mathematically, Chem II is a much more difficult course, and there is little that can be done to change that fact. Hopefully, the slower pace will allow students more time to practice on the mathematical portions of the course.

Two years ago, Organic Chemistry moved away from online homework. The instructor felt that the students were not nearly as prepared as when doing pencil and paper homework. This year, student performance increased as expected. We will remain using the pencil and paper homework. Each year, the instructor tweaks something in the way the course is taught and monitors results to see if there is an improvement. Many of the changes last year were laboratory focused. The lab exercises are certainly being done in less time than in the past, and there hasn't been a noticeable fall-off in understanding the material. Especially in Organic I, data sheets are being designed to guide students into writing appropriate lab reports without leaving out critical information. Other efforts to streamline the labs will be looked into this year.

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 continue to look 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. We hope to do more in test preparation for these students in the future. We have even considered a test prep course that is similar to what other universities offer.

In the capstone courses there are changes made periodically. Last year in Chemistry Advanced Lab, we put more emphasis on the written report, which was probably good for those planning to attend graduate school,

but since most are not, it may have not been the best change we could have made. We will likely go back to putting less emphasis on the written report in the future. The students are still exposed to specialty lab techniques and instrumentation that they are likely to see in graduate school. We would like to do more industrial education, and possibly plan some on-site visits. Contacts are being made with industries in the region to allow on-site visits.

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 higher retention rate, and 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. We are also planning to start a foundation fund specifically for student travel purposes. Ten years ago, we rarely had students presenting at meetings. Now, we are having 12-15 presentations at meetings, and sometimes even publications involving student research. The Research Program for Minority Students (RPMS) was grant funded originally; however, it is now funded totally by UAM and external grants. The program has been hugely successful at getting students into summer research programs and graduate programs. This year, we had four students get into prestigious summer internships. (Walker Jarret, Cornell University; Don White, III, University of Colorado; Rachel Knight, UAMS; and John Mitchell, Arkansas Children's Hospital) We are encouraging more students to apply for those positions. We are encouraging our students to get more involved with research, clubs, and other extracurricular activities in hopes that increasing retention will also increase their class performance.

It appears that motivation may be a key in increasing learning, and retention, at the freshmen level. 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 enrolled. 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. Much time is spent on the level of effort required to be successful in our courses. A lot of effort is being spent on topics that pertain to retention of students. Faculty discussed the importance of giving a full effort in their courses. Teaching students how to be college students is just as important as teaching them course content.

7. 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. Some faculty post detailed answer keys with suggestions on Blackboard. 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 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.

In doing recent program reviews for Biology, Chemistry, and Natural Science the faculty had to work together to put those documents together. During that time, a discussion was held about the possibility of forming an assessment committee for the unit that would be responsible for designing a new assessment plan for the Math and Sciences that would fit into the overall plan for the University. I'm certain that many aspects of the current plan would be kept; however, organization of information and the development and implementation of new ideas are needed. During faculty development week School meetings, this will be discussed.

8. 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. Dr. Bramlett continues to be active with the Arkansas Advanced Placement programs. He provided instruction at several Advanced Placement test preparation workshops. He provided instruction for over 80 Advanced Placement Chemistry students and their teachers at prep sessions for El Dorado and Star City schools. At each event, a few minutes were taken to recruit students into programs at UAM.

In the past, 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. In the following years, it was effective in recruiting students from Star City, Crossett, and Rison. This year, El Dorado, Star City, Monticello, and Dumas, were visited by Dr. Bramlett. There is an open invitation to all the schools in the region, and some outside the region, for guest lectures by faculty.

Dr. Bramlett and other faculty enjoy the off-campus recruiting events, like those held at El Dorado, Jacksonville, and Stuttgart last year. Even though the number of contacts made was small, it was good to get our info out to those that visited.

We hosted the Regional Mathematics Contest. At this event, faculty and representatives from Admissions were given the opportunity to meet with students and discuss the potential to attend college at UAM. The Regional Science Fair, normally held at UAM, was cancelled due to campus being closed by flooding.

Dr. Bramlett, along with Dr. Andrew Williams, and Tracie Jones of the Education Renewal Zone, is still working on the forming of a southeast Arkansas chemistry teachers group that will meet monthly. The goal is to provide resources for teachers so that the students will be better prepared when they college. Recruitment of students to UAM will also be an underlying effort. Instructional materials from various UAM courses will be provided to teachers as a resource for those teaching advanced placement courses.

To retain students, the faculty in Math and Sciences continue to give 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 website at: <http://www.uamont.edu/pages/school-of-mathematical-and-natural-sciences/degree-programs/>. Curriculum guides for the specific majors can be found in the UAM Catalog.

The School of Math and Sciences puts a great emphasis on getting students involved with research programs. As early as the freshmen year, faculty in Math and Sciences identify students that would benefit from being involved in research programs. The students can earn extra money, but it also provides an opportunity to forge excellent relationship with a faculty mentor. Last year, about 22 students were involved with research projects. Thirteen of those students presented their research findings at state, regional, or national meetings.

Scholarships are also provided by the School of Mathematical and Natural Sciences. In the upcoming year, \$24,836 will be awarded to approximately 32 students. These awards greatly reduce the financial burden on those that are attending college, thus improving retention. They also provide recognition for the top students in our unit.

The scholarships that will be given during the 2016-17 academic year are:

Scholarship	Year Budget
Gregory A Devine Memorial Scholarship	\$1,582
Mr. Jim Huey Scholarship	\$742
Mathematics & Physics Scholarship	\$826
Jack H Tharp Scholarship	\$1,582
William & Anna Hill Scholarship	\$3,766
James Gordon Culpepper Scholarship	\$1,188
Dr Albert L Etheridge Scholarship	\$1,238
Victoria Ku Scholarship	\$1,060
Wilburn C. Hobgood Scholarship	\$1,108
Herman C. Steelman Scholarship	\$864
Dr. Van C. Binns Scholarship -Pre-Med	\$2,090
Dr. Paul A. Wallick, Sr. Scholarship	\$708
Mathematics Scholarship	\$672
Miller Sisters Scholarship - Science	\$1,900
Anthony T. & Faye Chandler Scholarship	\$294
Carolyn Hibbs Thompson Chem Sch	\$2,038
Dr. C. Lewis & Wanda W. Hyatt Sch	\$960
Robert H. Moss Endowed Scholarship	\$704
Earl K. Phillips Math & Sciences Sch	\$1,182
Bland Scholarship	\$820
Stephen Moss Scholarship	\$578
Total	\$24,836

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, Sigma Zeta, 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, 2016-17 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 Appendices D & 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. 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. Three students qualified for the Bachelor of General Studies degree without even taking an additional course. One student needed one course, and has taken that course to complete the BGS degree.

**Appendices for the
Annual Assessment Report
2015-2016**

School of Mathematical and Natural Sciences

- Appendix A Nationally Scored Exam Results
PCAT, MCAT Scores
- Appendix B Initial Placement Information
- Appendix C Exit Surveys
- Appendix D Number of Graduates
- Appendix E Number of Majors

Appendix A

Nationally Scored Exam Results

PCAT Scores

MCAT Scores

DAT Scores

GRE Scores

PCAT Exam Scores

Student A Test Date Oct 2015 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	410	66
Biology	416	74
Reading Comprehension	399	49
Quantitative Ability	405	56
Chemistry	418	76
Composite	409	67

This student was accepted for 2016 admission into pharmacy school at UAMS .

Student B Test Date July 2015 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	387	25
Biology	396	35
Reading Comprehension	409	68
Quantitative Ability	388	23
Chemistry	415	72
Composite	399	43

This student was accepted for 2016 admission into pharmacy school at UAMS and Harding

Student C Test Date June 2014 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	unknown	unknown
Biology	unknown	unknown
Reading Comprehension	unknown	unknown
Quantitative Ability	unknown	unknown
Chemistry	unknown	unknown
Composite	unknown	84

This student was accepted for 2016 admission into pharmacy school at UAMS and Harding University. The student will be attending UAMS.

Student D Test Date July 2015 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	362	3
Biology	425	84
Reading Comprehension	369	8
Quantitative Ability	365	2
Chemistry	399	45
Composite	385	12

This student also took the Oct 2015 exam; however, did not report individual scores. The composite score was reported as 30th percentile; however, the exams were "superscored" which allowed admission. This student was accepted for 2016 admission into pharmacy school at Harding.

Student E Test Date July 2015 The Psychological Corporation

Multiple Choice Scores	Scaled Score	Percentile Rank
Verbal Ability	388	25
Biology	374	8
Reading Comprehension	381	20
Quantitative Ability	396	39
Chemistry	389	28
Composite	385	16

This student also took the Oct 2015 and Jan 2016 exams; however, did not report individual scores. The January composite score was reported as 25th percentile; however, the exams were "superscored" which allowed admission. This student was accepted for 2016 admission into pharmacy school at Harding.

MCAT Test Scores

Student A

Test Date	July 2015	Score	Percentile
		Total Score	495 35
Test Date	June 2016	Score	Percentile
		Total Score	499 49

This student was declined for admission in 2016 at UAMS. Subject subscores were not provided by the student.

Student B

Test Date	July 2015	Score	Percentile
	Total Score	493	29

This student was declined for admission in 2016 at UAMS.

Appendix B

Current Year Placement of Graduates 2015 -2016 Graduates and Other Placement

Graduate	Hon	Conferral Date	Major 1	Major 2	Minor	Initial Placement
Student 1	M	5/6/2016	Biology		Nat Sci	HU College of Pharmacy
Student 2		5/6/2016	Biology	Nursing		Working as nurse with BSN degree
Student 3	M	5/6/2016	Math		Teaching & Learning	Teaching at Warren School District (Math)
Student 4		5/6/2016	Math		Teaching & Learning	MAT Program/Dermott School District (Math)
Student 5		12/16/2015	Natural Sci (Life)			Working in clinical lab in Dallas area
Student 6		5/6/2016	Biology		Nat Sci	MAT Program
Student 7		8/4/2015	Biology		Nat Sci	Working as parapro/considering graduate school
Student 8	C	5/6/2016	Biochemistry		Biology	UAMS College of Pharmacy
Student 9		8/4/2015	Biology	Biochemistry		HU College of Pharmacy
Student 10		5/6/2016	Biology (Org)			Titanium Environmental field biologists
Student 11	M	5/6/2016	BGS		Biology	Helena Chemical Company, Chico, CA
Student 12		8/4/2015	Math		Physics	Mary Kay Sales
Student 13		8/4/2015	Biology	Biochemistry		Applying for position in local industries
Student 14		5/6/2016	Chemistry		Collateral	MAT Program / Crossett School District (Chem)
Student 15	M	5/6/2016	Math		Physics	Amateur Golf Tour (Europe)
Student 16		5/6/2016	Math		Physics	Amateur Golf Tour (Iceland) /Teaching Golf
Student 17	C	5/6/2016	Biology	Biochemistry		MCAT Prep and applying to Med School for 2017
Student 18		8/4/2015	Biology		Nat Sci	Employed at Oklahoma City Zoo
Student 19		5/6/2016	BGS		Bio / Chem	Health and Wellness Consultant for Plexus
Student 20		5/6/2016	Natural Sci (Life)			Grad Asst at UAM in Student Affairs/Masters in College Student Personnel
Student 21		8/4/2015	Biology		Nat Sci	Entered Masters program, but dropped to do Physicians Assistant Program
Student 22	S	5/6/2016	Math		Physics	Biophysics PhD program at UA
Student 23		12/16/2015	Natural Sci (Life)	English	Nat Sci	Employed at UAM / Planning graduate school
Student 24		5/6/2016	Biology		Nat Sci	HU College of Pharmacy
Student 25		12/16/2015	Math		Physics	Data Integration Analyst for Integrated Direct Marketing
Student 26		5/6/2016	Biology	Chemistry	Math	Chemistry Ph.D. program at UA
Student 27		8/4/2015	BGS		Bio1 /Bio2	Working for AT&T

Student 28	M	5/6/2016	Math		Teaching & Learning	MAT Program/Hermitage School District (Math)
Student 29		12/16/2015	Natural Sci (Life)			Planning to apply to Physical Therapy program
Student 30		5/6/2016	Biology	Biochemistry		UAMS College of Pharmacy
Student 31		5/6/2016	Biology	Biochemistry		UAMS College of Pharmacy
Student 32		5/6/2016	Chemistry		Math	Chemistry Ph.D. program at LSU
Student 33	M	5/6/2016	Biology	Biochemistry		Employed at UAMS
Student 34		5/6/2016	BGS		Bio / Chem	Seeking management position in local industry
Student 35	M	5/6/2016	Biology	Biochemistry		Seeking employment at Hach Chemical and considering applying to graduate programs for next year
Student 36		5/6/2016	Biology	Biochemistry		Working at City Drug as Pharm. Tech

Acceptances to professional schools by students other than 2016 graduating class

Student #	Class	Major 1	Major 2	Minor	Position
Student 37	Post-grad	Biology	Biochemistry		MeHarry College of Dentistry, Nashville, TN
Student 38	Course taker	Biology		Nat. Sci	American University of Antigua College of Medicine

For honors: C= Cum Laude, M = Magna Cum Laude, S = Summa Cum Laude

Appendix C

Graduating Senior Exit Interviews

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?

Upon graduation, I will continue to work for the Office of Student Programs and apply for the Student Affairs Graduate Assistant position where I will work to get my Masters of Science in College Student Personnel.

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

Yes, I feel that the University of Arkansas at Monticello helped prepared me for my next stage in life

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

I like how the Faculty is student oriented and relate to us on a personal level. They are always willing to help and make accommodations for us to help us grow and succeed. The science center felt like my second home where I got to meet amazing friends in my major and help me with studies. I joined the Biology Club two years ago and it helped me give back to the community and build bonds that I will cherish after I leave UAM. The faculty want us to go on to bigger and better things and we have a high expectation in our department to represent the School of Mathematical and Natural Sciences and the university. Its like one big family over in that area and I will really miss it.

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

Some weaknesses that I see if just everything is so old and outdated or obsolete. We really need that new up to date building with all new equipment to give us better opportunities. Another thing is I would like to see the department offer more classes/electives that can help us in many different aspects of math or science.

What changes do you recommend?

When the new science center gets build it will make things a lot better. I'm very proud of what we accomplish with what we are given and I am proud to have such a wonderful department who I can come back and be a part of when I get established after graduation

Is there anything else you would like to add?

This is just my opinion but I wish that the department did their senior event as a formal banquet in the UC and have the seniors and faculty and awards and all of the odds and ends. I know most departments do it like that and its more sentimental that way to me but that is just my opinion and I do appreciate the hard work that goes into the one we have now and thank you for doing something for us!

The following information is optional but highly recommended:

Name: Payton Miller

Major(s): Natural Science

Minor(s): N/A

E-mail address DPM03295@uamont.edu facebook user name? Payton Miller

Postal Address 1061 Hwy 11 South DeWitt, AR 72042 Telephone number 870-509-3004

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?

After graduation from UAM I will be attending Harding Pharmacy School

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

Yes, I do feel prepared for my professional life

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

I like how well the material is prepared. The teachers are amazing

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

I honestly don't know. I haven't really had any complaint the four years I've been here.

What changes do you recommend?

There is nothing I recommend changing

Is there anything else you would like to add?

The following information is optional but highly recommended:

Name: Brandi Berryman
Major(s): Biology
Minor(s): Natural Science
E-mail address blberryman@gmail.com facebook user name?
Postal Address 111 Berry Lane, Monticello, 71655 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:

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What are your plans after graduation?

I would like to work one year in the math field, then pursue a doctorate in mathematics. I'm leaning toward a career in academia.

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

Yes, I don't have a lot to compare to, but yes, I think so.

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

Mutual respect between faculty and students.

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

Facilities

What changes do you recommend?

More technology in the classrooms. Maybe smart boards

Is there anything else you would like to add?

The following information is optional but highly recommended:

Name: Evan Comeau

Major(s): Math

Minor(s): Teaching and Learning

E-mail address evan_comeau_5@hotmail.com facebook user name? Evan Comeau

Postal Address 41 Stonebridge Lane, Waverly, Nova Scotia, Canada, B2R1H5

Telephone number

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

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What are your plans after graduation?

To enter the MAT program and teach mathematics

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)

I loved how small the classes were. I feel like it helped me get the one on one time I needed. Also, I loved how helpful most of the professors were.

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

I did not like that some of the classes are only offered in the spring of odd years. If you mess up, like I did, you cannot retake the class before graduation.

What changes do you recommend?

Please fix the computer in A3.

Is there anything else you would like to add?

Dr. Abedi, Dr. Fox, and Dr. Dolberry are fantastic professors. I owe my success to them.

The following information is optional but highly recommended:

Name: Payton Miller

Major(s): Mathematics

Minor(s): Teaching and Learning

E-mail address mdunn11633@gmail.com_ facebook user name? Monica Dunn

Postal Address P.O Box 1262, McGehee, AR 71654 Telephone number 870-538-8690

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?

Work for a while in an environmental company, then graduate school

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)

The professors genuinely care about their student

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

Needs new lab equipment and facilities

What changes do you recommend?

Refurbishing labs

Is there anything else you would like to add?

The following information is optional but highly recommended:

Name: Jordan Hopper

Major(s): Organismal Biology

Minor(s): N/A

E-mail address DPM03295@uamont.edu facebook user name? Payton Miller

Postal Address 437 South Main St, Monticello, AR 71655 Telephone number 870-723-3461

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

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What are your plans after graduation?

Grad school in chemistry at UA. Also accepted to UT

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

Yes, Research experience helped prepare you. Going to meeting showed what was expected of grad students

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

Small class size. All professors really care. Learn basics better than anywhere else due to lack of modernized equipment.

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

Some professors not in office a lot. Much of the equipment doesn't work.

What changes do you recommend?

Organic drill taught by someone other than the instructor

Is there anything else you would like to add?

UAM is a great school. I love it and don't want to leave

The following information is optional but highly recommended:

Name: Cynthia Robinson

Major(s): Chemistry and Biology

Minor(s): Math

E-mail address cindyrobinson2012@yahoo.com

facebook user name? cindy robinson

Postal Address

Telephone number 479-426-0238

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

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What are your plans after graduation?

LSU for grad school in chemistry

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

Most of the time. there are still times I feel I am lacking something

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

The professors, most have an open door policy. Makes you feel welcome. Leslie is awesome.

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

The students didn't care. The younger they are, the less they care
The lack of funding, we need to be able do as much as any other school.
The lack of support from the university to purchase equipment.

What changes do you recommend?

The problems I had aren't really the problems the school can fix.

Is there anything else you would like to add?

I'm glad I came to this school. I never would have had the opportunities if I had gone to another school. I didn't want to go here, but my dad wanted me to be close to home. I did, it was the best choice for me.

The following information is optional but highly recommended:

Name: Autumn Webb

Major(s): Chemistry

Minor(s): CIS and Math

Postal Address

Telephone number 870-723-5837

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

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Appendix D

Graduation Numbers by major per year

Math and Science Graduates by Year by Major

									Page	10 yr	3 yr
	09-10	10-11	11-12	12-13	13-14	14-15	15-16		Total	Mean	Mean
Biology	10	7	19	12	16	7	17		217	12.4	13.3
Chemistry	4	6	5	6	11	12	12		94	6.3	11.7
Mathematics	4	0	8	2	3	4	8		86	4.2	5
Natural Science*	8	4	12	2	4	4	4		59	5.0	4
Bach of Gen St**					2	1	4		7		2.33
Total	26	17	44	22	34	27	41		456	27.9	34

	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
Biology	6	6	9	4	12	10	12	9	15	12
Chemistry	5	4	2	2	4	2	2	1	2	4
Mathematics	4	5	5	5	3	9	5	5	6	2
Natural Science*	-	-	0	0	4	1	4	3	7	2
Total	15	15	16	11	23	22	23	18	30	20

*Natural Science degree added in 2001

**BGS graduates shown if Math and Science emphasis areas are used; however, are not used in calculating the total number of graduates per year, or averages

Appendix E

Math and Science Majors by Class per Year

Majors By Class For Fall Terms

Majors Year	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Allied Health																		
Freshman	24	14	14	17	16	13	27	16	13	28	23	16	25	29	30	16		
Sophomore	7	8	10	8	9	5	5	8	8	8	8	11	6	12	11	9		
Junior	5	2	1	1	3	4	2	4	3	4	3	4	4	5	6	3		
Senior	3	1	0	0	2	2	0	3	0	0	2	1		1	2	1		
Pre-Fresh	0	0	1	0	0	0	0	0	9	8	5	9						
Special*	0	0	0	0	1	0	0	0	0	0	0	0						
Post -Bach	0	0	0	0	0	0	0	1	0	0	0	0						
Total	39	25	26	26	31	24	34	32	33	48	41	41	35	47	49	29	0	0
Biology																		
Freshman	9	5	10	9	13	14	10	10	11	9	8	9	7	10	16	16	29	19
Sophomore	4	4	7	5	6	12	8	7	4	10	7	11	8	3	10	5	8	16
Junior	10	4	5	6	9	8	10	7	8	7	8	9	10	9	6	11	5	6
Senior	8	6	8	7	10	11	13	11	13	18	15	17	12	20	16	10	18	12
Pre-Fresh	0	0	0	0	1	0	0	3	1	3	1	3						
Special*	0	0	0	0	0	0	0	0	1	0	0	1						
Post Bach	0	0	0	0	1	0	3	0	1	0	0	2			1	1		
Total	31	19	30	27	40	45	44	38	39	47	39	52	37	42	49	43	60	53
Chemistry																		
Freshman	1	3	3	1	2	3	3	5	6	3	1	3	5	3	6	10	13	3
Sophomore	3	1	1	2	3	2	2	5	3	2	1	0	2	3	4	4	5	3
Junior	3	5	3	2	3	2	2	1	5	7	2	2	2	3	4	7	4	7
Senior	4	3	2	6	3	0	2	3	2	2	8	5	9	5	4	4	6	6
Pre-Fres	0	0	0	0	1	0	0	0	3	0	0	1						
Special*	0	0	0	0	0	0	0	0	0	0	0	0						
Post Bach	1	1	0	0	0	1	0	0	0	0	0	1						
Total	12	13	9	11	12	8	9	14	19	14	12	12	18	14	18	25	28	19
Mathematics																		
Freshman	3	5	6	3	4	3	3	7	4	6	3	5	7	9	8	6	8	5
Sophomore	5	3	2	3	6	8	6	3	5	7	7	5	5	3	5	2	2	2
Junior	1	5	6	4	3	5	5	6	5	1	5	5	3	4	3	9	4	3
Senior	5	8	5	8	6	11	13	7	7	8	2	5	5	5	3	4	3	6
Pre-Fresh	0	0	0	0	0	0	0	0	1	0	1	2						
Special*	0	1	0	0	0	0	0	0	0	0	0	0						
Post Bach	0	1	1	3	0	0	0	0	0	1	0	0		1				
Total	14	23	20	21	19	27	27	23	22	23	18	22	20	22	19	21	17	16

Majors Year	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Natural Science																		
Freshman	0	0	0	1	3	1	2	2	1	1	0	0	1	2		1	14	19
Sophomore	0	0	0	1	1	3	2	0	0	1	1	0	1	2	2		9	4
Junior	0	0	0	0	1	3	2	2	3	2	1	0	1	4	3	2	7	5
Senior	0	0	0	0	2	2	4	8	6	6	4	4	3	4	3	5	6	5
Pre-Freshman Special*	0	0	0	0	0	0	0	0	0	0	1	0						
Post Bachelor	0	0	0	0	0	0	0	0	0	0	0	1						
Total	0	0	0	2	7	9	10	12	10	11	7	5	6	12	8	8	36	33
Pre-Engineering																		
Freshman	12	16	7	9	8	6	4	7	11	7	5	10	6	9	10	8	11	10
Sophomore	4	5	2	2	3	1	1	2	3	3	2	2	2	1	2	2	3	1
Junior	0	2	0	0	0	2	0	0	0	1	1	2				1	1	
Senior	0	0	1	0	0	0	0	0	0	0	0	0						2
Pre-Freshman Special*	0	0	0	0	0	1	0	0	1	3	2	0						
Post Bachelor	0	0	0	0	0	0	0	0	0	0	0	0		1				
Total	16	23	10	11	11	10	5	9	15	14	10	14	8	11	12	11	15	13
Pre-Medicine																		
Freshman	37	41	29	24	21	26	28	19	30	20	16	14	28	20	23	22	27	21
Sophomore	11	13	15	14	20	9	5	5	7	5	7	4	2	7	6	6	3	16
Junior	5	5	7	11	7	10	7	5	2	3	5	4	2	3	7	1	5	1
Senior	3	1	3	5	5	7	3	2	0	0	1	0	1	2	4	5	1	6
Pre-Freshman Special*	1	3	1	3	0	1	0	5	21	21	20	19						
Post Bachelor	0	0	0	0	1	0	0	0	0	0	0	0						
Total	58	63	55	57	54	53	45	36	60	49	49	41	33	33	41	35	36	44
Pre-Pharmacy																		
Freshman	7	7	7	15	10	11	13	14	14	16	15	8	14	15	18	15	11	11
Sophomore	0	4	6	5	11	3	6	9	8	3	9	7	3	8	5	8	6	6
Junior	1	3	5	4	3	9	2	4	6	3	3	4	6	3	5	3	9	7
Senior	0	0	3	3	4	3	3	1	4	0	1	0		3	4			3
Pre-Freshman Special*	0	0	0	0	2	1	0	1	7	7	12	5						
Post Bachelor	0	0	1	0	0	0	0	2	0	0	1	0						
Total	8	14	22	28	30	27	24	31	39	29	41	24	23	29	32	26	26	27

Majors Year	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Total Math and Sciences	178	180	172	183	204	203	198	195	237	235	217	211	180	210	228	198	218	205