Mathematics Program Review

University of Arkansas at Monticello

School of Mathematical and Natural Sciences

Fall 2012

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Goals, Objectives, and Activities

1. *Describe specific educational goals, objectives, and activities of the program.*

   The mission the University of Arkansas at Monticello (UAM) shares with all universities is the commitment to search for truth and 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. This serves as the basis for the goals of the programs housed in the School of Mathematical and Natural Sciences. The specific goals for the School of Mathematical and Natural Sciences are:

   1. To provide academic programs which promote the development of professional scientists and mathematicians and provide opportunities for all students to enhance their understanding of the natural sciences and mathematics.
   2. To prepare individuals for successful careers in industry and teaching and for graduate studies in science and mathematics
   3. To provide curricula for pre-professional studies in dentistry, medicine, optometry, pharmacy, and allied health (physical therapy, radiological technology, respiratory therapy, medical technology, occupational therapy, and dental hygiene).
   4. To provide technical and analytical courses to support studies in agriculture, forestry, nursing, education, pre-veterinary medicine, psychology, and wildlife management.
   5. To serve the general education program through courses in biology, chemistry, earth science, mathematics, physics, and physical science that provide a basic background for a baccalaureate degree.

These goals are important to the Mathematics program, whose main objective is to offer Bachelor Science degrees with a major or minor in Mathematics. The program prepares graduates to work in a variety of positions within industry, business, and educational institutions, or attend graduate programs in applied or pure mathematics. Students are encouraged to consider post-graduate education upon graduation.

The faculty members have high expectations in the classroom in all mathematics courses, and they willingly work with students outside the classroom to help them rise to the level of expertise needed to be successful in their course work. They also work closely with students in activities outside the classroom to enhance their overall experience at UAM, and to help them mature into well-rounded students that are involved with their community. Some of these specific activities are:

A. Sigma Zeta Math and Science Honor Society is an active student organization which fosters group camaraderie and allows students to network with others in the School of

Mathematics and Natural Sciences. The students in the Beta Pi chapter participate in various service projects throughout the year, including working with the Southeast Arkansas Regional Science Fair and the ACTM Regional Mathematics Contest. They host a biannual Science Center cleanup day in which classrooms and laboratories are deeply cleaned and help with the removal of unused materials and equipment. Members often work with high school students on various events on campus, such as Advanced Placement test preparation events, to promote interest in the sciences and mathematics.

B. The Southeast Arkansas Regional Science Fair (SEARSF) has been hosted by UAM School of Mathematical and Natural Sciences for fifty eight years. The fair is open to all high school and junior high school students from the schools located in the southeast region of the state. The mathematics faculty members and mathematics students play a large role in hosting the SEARSF, and for many years, the director has been a member of the mathematics faculty. The students present their research projects in a wide variety of categories, including Animals Sciences, Biochemistry, Biology, Chemistry, Computer Science, Engineering, Environmental Sciences, Mathematics, Plant Sciences, Space Sciences, and an all-encompassing classification for team projects. Faculty members and students often work the event to assist the participants in getting their displays set up properly. Others will work as judges of the projects, others work with teachers and students during the research phase of the preparing their projects.

C. The Southeast Arkansas Math and Science Alliance is a group of area science and mathematics teachers that meet during the academic year for professional development activities. This organization is coordinated by faculty members in the School of Mathematics and Natural Sciences and the UAM STEM Center, whose charge is to promote science, technology, engineering, and mathematics teaching in the local schools. Many of the Mathematics majors that are interested in a teaching career use this group to make contacts within the local schools and also to get ideas for classroom activities they can use when they become a teacher.

D. The UAM Math and Physics Club is a group consisting of majors and minors from math and physics, and faculty members from those disciplines. The major role of this group is to promote mathematics and physics. They provide service for the mathematics and physics programs and also provide a social outlet for the students in these majors.

E. UAM Math Tutor group consists primarily of junior and senior level Mathematics majors. Essentially all of our majors are employed as work-study students to tutor the lower level mathematics students. Not only is this a benefit to the lower level students, but it gives the tutors a much deeper understanding of the material, and also allows them to hone their teaching skills prior to going into the MAT program. This very successful program started many years ago in the School of Math and Sciences; however, when UAM formed its university-wide tutoring center it was moved to that location. After the move, many realized that the mathematics tutoring program was not as successful, and it was moved back to the School of Mathematics and Sciences computer lab in 2008. The tutors operate the lab approximately 35 hours per week and help the lower level math students with ALEKS, My Math Lab, and WebAssign homework and practice problems, and also provide one-on-one supplemental instruction to those with the greatest need.

F. Undergraduate Research opportunities exist for the students majoring or minoring in Mathematics. One faculty member has built a computer cluster that is able to do very sophisticated mathematics problems very efficiently. Several mathematics students have taken part in undergraduate research projects involving the cluster. They have learned a great deal about programming languages, and how to do high level computations using a cluster. Some of the students have made presentations at state and regional meetings, and have had their research submitted for publication.

G. Mathematics Seminar is the capstone course required of all Mathematics majors. Typically the course is taken during the student's senior year after having the bulk of their required and elective course work. Normally, the student chooses a mathematical topic in their area of interest with the help of a faculty member. The student researches the topic and extends the level of coverage beyond what is covered in other courses. At the end of the term, the student does a public presentation to other students and faculty. The student is evaluated on content, organization, clarity, accuracy, completeness, quality of visual aids, and the ability to answer questions and discuss the material in depth. This course is critical in the overall development of the student, and in the preparation of the student for graduate school or a career in teaching.

2. *Explain how the program serves the general education program and other disciplinary programs on campus, if applicable*

An important goal in the Mathematics program is to provide support courses for other majors and for the general education program. UAM is an open admissions university and it is very important that we provide specific mathematical skills needed for other majors, and provide them problem solving skills needed to be successful. Remedial courses are provided for those that have a weak background in mathematics. Support courses are taught for several other majors both in the School of Mathematics and Natural Sciences and for other majors on campus.

Since UAM does not have minimum ACT requirements to enter the University, a large percentage of students that come to UAM are deficient in mathematical skills. As part of the general education requirements, which are mandated by state law, each student is required to take College Algebra or a similar course at least as sophisticated as College Algebra. The entering student will be placed in College Algebra or Survey of Mathematics if their mathematics ACT score is 19 or higher, or equivalent on another nationally scored comparable exam. Students with ACT math scores in the range 16 - 18 will be placed in Intermediate Algebra and those with an ACT score less than 16 will take Introductory Algebra. Students are required to enroll in mathematics each semester until the general education mathematics requirement is met. Approximately 65% of the entering freshmen are required to take at least one remedial math course. Students that enroll in Introduction to Algebra or Intermediate Algebra are required to make a grade of C or better to proceed to the next level. Some students will take the ASSET exam or Compass exam and move forward to the next course by virtue of their test score. For those taking the freshman level college mathematics, a grade of D or better is needed to satisfy the General Education mathematics requirement; however, several majors require a grade of C or higher in College Algebra or Survey of Mathematics. Part of the mission of the Mathematics program is to place General Education students in an appropriate mathematics course based on their ACT or comparable score. A voluntary and free placement test is offered in the School of Mathematical and Natural Sciences.

In addition to offering courses for General Education, the Mathematics program contributes courses such as Trigonometry, Compact Calculus and Calculus as major or minor requirements in other disciplines such as Chemistry and specific majors in the School of Forest Resources. Mathematics faculty members work very closely with the School of Education to provide opportunities for their students to meet mathematics requirements in various teacher education programs. The mathematics faculty members teach three courses required by the School of Education in their preparation for elementary and middle school teachers. These courses are MAED 2243: Fundamental Geometric Concepts, MAED 3553: Number Systems, and MAED 3563: Geometric Investigations.

Pre-professional students (pre-medicine, pre-pharmacy, pre-dentistry, and some allied health majors) often take Trigonometry and Calculus I as part of the entrance requirements for their particular program.

While all majors are required to pass three hours of mathematics at the 1000 level or higher, there are several majors at UAM that require specific courses above the general education requirement. Table 1 shown on the next page indicates which courses are required for specific majors.

Table 1. Majors with Mathematics Requirements above the General Education Math Requirement.

Major	Survey of Math	College Algebra	Geometric Concepts	Geometric Investigations	Number Systems	Trig	Compact Calculus	Cal I	Cal II	Cal III	Diff Eq
P-4 Childhood Education	X	X	X		X						
Mid-Level Childhood Education	X	X	X		X						
Mid-Level Childhood Education Math/Sci Emphasis	X	X	X	X	X	X					
Mid-Level Childhood Education Algebra I Endorsement	X	X	X		X	X		X			
Forestry		X				X	X				
GIS		X				X	X				
Wildlife		X				X					
Biology		X				X					
Organismal Biology		X				X	X				
Chemistry		X				X		X	X	X	
Biochemistry		X				X		X			
Natural Science		X				X					
Pre-Professional Programs		X				X		X			
Pre-Engineering						X		X	X	X	X

3. *Document market demand and/or state/industry need for careers stemming from the program.*

The southeast Arkansas public schools have a high need for qualified mathematics teachers. Essentially every mathematics major that we graduate gets one or more teaching offers provided the student meets the criteria for admission into the Master of Arts in Teaching (MAT) program. Many of our graduates accept these positions because they are able to remain near their hometown. A recent study by the Indiana University of Pennsylvania named the majority of the school districts in Arkansas as natural science and mathematics high need districts based on the criteria set forth by the National Science Foundation (NSF). Every school district in the seven county region near UAM is on the critical needs list.

The Arkansas Department of Education has designated the entire state of Arkansas as a Mathematics 7-12 as a critical shortage area, and has implemented several programs to get qualified mathematics teachers in place. One such program is the Teacher Incentive Fund Program implemented approximately five years ago whose purpose in part was to increase the number of effective teachers teaching poor, minority, and disadvantaged students in hard-to-staff subjects. Other financial aid programs designed to increase the number of critical needs teachers are the State Teacher Education Program (STEP), Federal Stafford and Perkins Loan Cancellation, and Minority Teacher Scholarships. The partial implementation of the Common Core State Standard Initiative has increased the need for qualified mathematics teachers, especially in the rural areas.

The Arkansas Department of Education sometimes employs the Additional Licensure Plan (ALP) to address unusual emergency situations when licensed teachers are asked to teach in non-licensed areas, or at levels for which they are not licensed. This is currently a common practice in the Algebra I endorsement at the mid-level grades, provided the student meets the Praxis II minimum requirement of 161 on the Middle School Mathematics test #069. It is highly unlikely that anyone will pass this exam without a significant amount of course work in mathematics.

It is obvious that there is a great need for mathematics teachers in the state; however, industry and business also experiences the shortage of qualified mathematics graduates in the state. At the Arkansas Science, Technology, Engineering, and Mathematics (STEM) Summit held at Petit Jean, numerous business and industries each told how they could immediately hire numerous mathematics majors for positions if they were available. Currently, they must hire out of state graduates, or move the jobs to other regions. The Coalition has been working very closely with several universities on the UTeach program in hopes of preparing more math and science teachers. They sponsor several other programs to aid both math and sciences, such as the Arkansas Advanced Initiative for Math and Science, the EAST program, and Project Lead the Way, which puts hands on mathematics and engineering programs into the public schools at the middle school level.

4. *Document student demand for the program.*

Over the past ten years, the number of mathematics majors have been fairly steady in the low 20's. The following table shows the number of majors per class in the fall terms of the past ten years.

Table 2. Number of Majors per Class Level per year

Fall of	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Freshmen	4	3	3	7	4	6	3	5	7	9
Sophomore	6	8	6	3	5	7	7	5	5	3
Junior	3	5	5	6	5	1	5	5	3	5
Senior	6	11	13	7	7	8	2	5	5	4
Spec/Post BS	0	0	0	0	0	1	0	0	0	1
Total	19	27	27	23	21	23	17	20	20	22

During this time, there have typically been less than five students minoring in Mathematics. Most of the Mathematics minors have been students seeking the traditional Chemistry degree. Also, several of the chemistry students have double majored in Mathematics. With the inception of the biochemistry degree, in which students typically minor in biology, there has been a large decline of majors in the traditional chemistry degree. This may account for the slight decline in mathematics graduates in the last five years. The table below shows the number of mathematics graduates per year over the last ten years.

Table 3. Mathematics Graduates per Year

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total	10 Year mean
5	3	9	5	5	6	2	4	0	8	47	4.7

In 2011, there were zero graduates in Mathematics; however, there were three that completed course work in the summer or fall and received their degree. These students were included in the 2012 graduates. To be considered a viable program, Arkansas Department of Higher Education requires 4 graduates per year over a three year period. In 2011, the number of graduates dropped below the program viability standard, but the large class that followed in 2012 put the average back to an acceptable level.

The Mathematics faculty have spent time looking into several possible causes of the low number of Mathematics majors and graduates. While there is no definitive answer, some of the students who claim to be a math major or a math minor or pre-engineering change their major to another area after the first year. The nature of college-level mathematics often exceeds the expectations and/or the abilities of these students. Frequently these students do not have the proper mathematical background and after taking Calculus I (or some other upper level math courses) they decide that their skill level is not adequate for this pursuit. With UAM being an open admissions university, many incoming freshmen (approximately 64%) enter college in remediation in the area of mathematics, and this deters students from entering Mathematics as a field.

Curriculum

1. *Describe how program content parallels current think/trends in the field/trade (best practices, advisory committee recommendations, etc.).*

Math faculty continually review the curriculum in an effort to meet the needs of math majors, minors, pre-engineers as well as pre-service teachers seeking licensure at either the middle school or secondary level.

In the past few years, the state of Arkansas has moved to end of course testing at the end of remedial courses. UAM has chosen the Mathematics ASSET exam as the end of course assessment that is given at the end of Intermediate Algebra. This has led to a number of changes in topics covered in remedial mathematics courses. A small number of topics have been moved from College Algebra to Intermediate Algebra based on the fact those topics often appear on the Intermediate Algebra end of course exam.

Another trend that has been very popular is the use of on-line instruction. While we are opposed to totally on-line courses, we feel it is beneficial for students to have access to on-line homework and assessment which allows the student to get immediate feedback on their homework and also provides the instructor with information about student progress. The remedial mathematics courses use the ALEKS program while College Algebra and others have used WebAssign.

The calculus sequence has been modified few times. In 2001, the calculus sequence was changed from 4-hour courses to 5-hour courses, like many other universities. This reduced the number of semesters in the calculus and allowed majors to graduate in four years, even if beginning in College Algebra and Trigonometry their first semester. The latest change occurred in 2009 on the five hour lecture course Multi-Dimensional Calculus and Differential Equations. The transition from two hour Multi-Dimensional Calculus in the middle of semester to three hour Differential Equations was not as successful as originally hoped. It also made transferring of this course rather complicated. Also, pre-engineering students needed differential equations, but were not required to take Calculus III prior to transferring. The revised course consists of three hour lecture Calculus III and three hour lecture Differential Equations.

A trend that has swept the nation is the offering of college credit for Advanced Placement (AP) level courses taught in the high schools when the instructor has the appropriate credentials and teaches the course at the level of the college course. UAM has been a leader in the state in this area. Two instructors, housed at the Southeast Arkansas Educational Cooperative in Monticello teach courses to many Arkansas high schools via Compressed Interactive Video (CIV). College Algebra, Survey of Math, Trigonometry and Calculus I are offered. Students must meet GPA and ACT requirements to enroll in these courses. Hamburg High School also offers these courses as concurrent credit; however, they are taught with approved on-site instructors. Both sites work closely with our on-campus faculty members when planning course topics and work together when developing exams.

2. *Provide an outline for each program curriculum, including the sequences of courses.*

Proper advising is very important for Mathematics majors. For those that enter with the qualifications to go directly into Calculus I, there are no problems; however, many of our majors are deficient in Trigonometry and/or College Algebra. It is recommended that those incoming Mathematics majors take College Algebra and Trigonometry during their first semester of college. Some choose to take only College Algebra in their first term, and Trigonometry and Calculus I concurrently in their second term. Since many of the upper level courses are taught on a two-year rotating schedule, it is important that students complete the prerequisite courses as early as possible. The table below indicates our recently developed course offering schedule that is in the process of being implemented. By Spring 2013, the two year Mathematics schedule should be represented in the table below. Appendix A is the 8-Semester sequence of courses that serves as a guide for all Mathematics majors.

Table 4. Course Offering Schedule for Mathematics (MATH) and Mathematics Education (MAED) Courses									
Course	Every Semester	Every Fall	Every Spring	Fall Odd Years	Fall Even Years	Spring Odd Years	Spring Even Years	Summer	On Demand
College Algebra	X							X	
Trigonometry	X							X	
Survey of Math	X							X	
Compact Calculus			X						
Calculus I	X								
Calculus II		X							
Calculus III			X						
History of Math					X				
Prob. & Stats				X					
Number Theory					X				
College Geometry						X			
Abstract Algebra				X					
Linear Algebra							X		
Discrete Math							X		
Differential Eq						X			
Math Seminar	X								
Fund. Geom. Concepts			X					X	
Number Systems		X						X	
Geometric Investigations			X						
Methods of Teaching Math									X

3. *State the degree requirements, including general education requirements, institutional, college, or school requirements, and major requirements.*

The Bachelor of Science degree in mathematics requires 120 hours which includes 35 hours of General Education program, the Bachelor of Science identity requirement, 35 hours of major requirements and 8 hours supportive requirements. A minor is also required for the Mathematics major. General electives may be needed to reach 120 hours, but the number of hours will depend on the chosen minor.

The Minor in Mathematics requires twenty two hours of mathematics coursework. This includes the thirteen hour calculus sequence and nine hours of 3000 or higher level mathematics courses.

The General Education requirements are listed in Appendix B. The Mathematics Major and Minor Requirements are found in Appendix C.

4. *Indicate the semester/year the major/program courses were last offered. Exclude general education courses.*

Major Requirements (35 hours)

Course #	Course Title	Semester last offered
Required Courses: 26 hours		
MATH 2255	Calculus I	Fall 2012
MATH 3403	Probability and Statistics	Fall 2011
MATH 3453	Abstract Algebra	Fall 2011
MATH 3463	Linear Algebra	Spring 2012
MATH 3495	Calculus II	Fall 2012
MATH 3533	Differential Equations	Spring 2011
MATH 3543	Calculus III	Spring 2012
MATH 4711	Mathematics Seminar	Fall 2012
Mathematics Electives: 9 hours		
MATH 3233	History of Mathematics	Fall 2012
MATH 3413	Number Theory	Fall 2012
MATH 3423	College Geometry	Spring 2012
MATH 3513	Discrete Mathematics	Spring 2012
MATH 399V	Special Topics in Mathematics	Spring 2011
MATH 465V	Reading and Research	Spring 2011

5. *Provide Syllabi for discipline-specific courses and departmental objectives for each course.*

Syllabi for all MATH required and elective courses are found in Appendix D

6. *Outline the process for the introduction of new courses, including all internal curriculum review processes and the findings.*

The Mathematics faculty continually review the curriculum and make appropriate adjustments. Whenever a curriculum change is needed, the mathematics faculty discuss the changes and form a proposal. The proposal is reviewed by the Dean of Math and Sciences. When approved, the Dean submits the proposal to Academic Council, which is a group that includes the Deans of all units, the Registrar, and the Vice Chancellor of Academic Affairs. A review period of ten days begins at this point. This procedure ensures that all academic deans are aware of the consequences to their own programs before the new course is reviewed by the Curriculum and Standards Committee. This 10-day review process usually affords sufficient time for minor issues to be resolved. The proposal is reviewed at an Academic Council meeting, which meets approximately 8 times per semester. With Academic Council approval, the proposal is forwarded to the Curriculum and Standards (C&S) Committee. The School of Mathematics and Natural Sciences representative then presents to the C&S Committee. Occasionally, the Dean, or a faculty member will attend the meeting to answer any questions that may arise. With approval of the Curriculum and Standards Committee, the proposal is forward to the UAM Assembly where it is brought to a vote. Once it has received the approval of the Assembly, the proposal is reviewed by the Board of Trustees, and then the Arkansas Department of Higher Education. Once all approvals have been made, the proposal is sent back to the Registrar's Office for final operation and inclusion into the official catalog.

7. *List courses in the proposed degree program currently offered by distance delivery.*

None of the courses required for the Mathematics major are offered by distance delivery at this time; however, Survey of Mathematics and Geometric Concepts are occasionally offered by CIV to other campuses as part of the teacher education 2+2 transfer agreement.

8. *Describe the instructor-to-student and student-to-student interaction for distance courses (prerequisite courses, lab requirements, examination procedures-online/proctored, and instructor to student assignments).*

The distance courses are limited to at most two courses per year, and are never courses that are taken by Mathematics majors. They are normally courses offered at the request of School of Education. The instructor is available to their students via email, telephone, and designated office hours. Naturally, these students are more serious students and would make every effort to contact their teachers if needed. The students are at the satellite campus and can interact face-to face with each other. Exams are scheduled the same day or close to date scheduled at UAM campus for multi-section courses. The students will be monitored by a mentor at the appropriate campus. The final exam takes place at UAM and if a student cannot attend, other arrangements will be made such as giving the test in one of the two campuses.

Program Faculty (fulltime/adjunct/part-time)

1. *Provide curriculum vitae or program faculty information form for all fulltime program faculty. The vita or form should include the following: all degrees and institutions granting the degrees; field or specialty of degrees; number of years employed as program faculty at the institution; current academic rank, if applicable; professional certifications/licenses; evidence of quality and quantity of creative and scholarly/research activity; evidence of quality and quantity of service activities; evidence of professional activities and non-teaching work experiences related to courses taught; list of course numbers/course titles of credit courses taught over the past two academic years; and other evidence of quality teaching.*

Please see Appendix E for faculty vitae.

2. *Indicate the academic credentials required for adjunct/part-time faculty teaching major/program courses.*

Several faculty in Mathematics are members of the committee to evaluate adjunct/part-time faculty credentials. The minimum requirements for teaching as an adjunct faculty member are a master's degree and eighteen hours of graduate course work in mathematics. The eighteen hours of graduate course work must consist of a minimum of twelve hours of content that is

specifically at the secondary level or higher (elementary and middle school teaching content courses will not count in this 12-hour requirement). The other six graduate hours may be in either math content or math pedagogy (math pedagogy cannot be specifically either elementary or middle school).
The math pedagogy courses are included MAED 5293, Teaching Algebra, MAED 5293 Math Coaches I, II, III, IV, and V, and Math 5623, Higher Order Math.
The math content courses include all the following: MAED 5293, Topics in Algebra, Linear Algebra, Number Theory, Group Theory, Topology, Real Analysis, Probability and Statistics, Vector Analysis and Real or Complex Analysis.
Any person hired as an adjunct faculty member without the full qualifications is hired on a provisional basis. It is expected that such persons would be working to complete the requirements. In particular, such persons would be expected to enroll in the graduate mathematics courses offered at the University of Arkansas at Monticello; or such persons could enroll in courses at other universities or take on-line or correspondence courses provided that written approval has been obtained in advance from the Dean of the School of Mathematical and Natural Sciences and the committee.

3. *Describe the orientation and evaluation processes for faculty, including adjunct and part-time faculty.*

During the faculty development week that occurs the week prior to the beginning of the fall semester there is an official orientation program for full time faculty which contains information and documentation on advising, regulations, available resources, and teaching facilities. Throughout the meetings there is number of workshops including academic advising, leaning the available software and accessible technology. In multi-section courses they also take part in specific course meetings that are organized by the course coordinator.
Each faculty, including adjunct faculty are evaluated annually. The faculty are required to submit a self-evaluation to the Dean of School of Mathematical and Natural Sciences. They are also evaluated by a minimum of three peer faculty members, their students, and observed in a classroom setting by the peer evaluators. The tenured faculty and non-tenure track faculty who have completed six years of service are required to undergo the full evaluation process at least once every five years. A full evaluation requires that three colleagues be chosen as peer evaluators with the individual being evaluated choosing two and the dean one. Peer reviewers of faculty having a full evaluation must make at least one classroom observation Also at least one section of each course the instructor teaches during the spring and the fall semester must complete a student evaluation. Others have one peer evaluator chosen by the dean. If an instructor is not having a full evaluation, one peer evaluator will be chosen by the dean. Faculty in the first six years of service are evaluated by students in every class. After the sixth year, the faculty is required to have only one section of his or her classes complete a student evaluation per calendar year. Faculty submitting abbreviated evaluations should include only new accomplishments in their self-evaluations.
Once this process is complete, the dean reviews all of the combined evaluations to assess faculty performance. The dean then uses the totality of the evaluations by the faculty peer, students, self-evaluation, and observation data to complete a review of their performance. The dean schedules a meeting with the faculty member to discuss their accomplishments and make suggestions for possible improvements. After this review, the evaluation and all supporting material are sent to

the Vice Chancellor for Academic Affairs (Provost) for his review and comments. If a faculty member disagrees with the Dean’s evaluation, he or she may send information to the Vice Chancellor for additional consideration. After this is completed, the Vice Chancellor for Academic Affairs sends his recommendation to each faculty and the dean.

4. *Provide average number of courses and number of credit hours taught for full time program faculty for the current academic year.*

The course load for a full time faculty member that holds an academic rank of Assistant Professor, or higher, is 12 credit hours per term. The course load for those holding the rank of Instructor is 15 credit hours per term. Occasionally, there are opportunities for extra courses to be taught as an overload for additional pay. Summer teaching opportunities are available for courses that meet the minimum enrollment of 10 students. Instructors never teach courses that are found in the Mathematics major, but do teach pre-requisite courses (College Algebra and Trigonometry) for students that don’t have sufficient background to directly enter into Calculus I. All courses at the Calculus level, or higher, are taught by tenured, or tenure track, faculty members. The School of Mathematical and Natural Sciences has five full time Associate Professors, one full time Assistant Professor, and four full time Instructors. See the table below for faculty workload for the past academic year.

Table 5. Faculty Workload for Summer II 2011-Summer I 2012

Full Time Faculty		**Summ II 2011**			**Fall 2011**			**Spring 2012**			**Summ I 2012**			
Faculty Member	**Title**	credit hrs	contact hrs	SSCH	credit hrs	contact hrs	SSCH	credit hrs	contact hrs	SSCH	credit hrs	contact hrs	SSCH	Annual SSCH
Abedi, Farrokh	Assoc. Prof. & Asst. Dean				9	9	174	9	9	138	6	6	36	348
Chapman, Linda	Instructor				15	15	543	15	15	504	6	6	60	1107
Dolberry, Charles	Assoc. Prof.				14	14	299	12	12	177	3	3	21	497
Efird, Carole	Assoc. Prof.				12	12	435	12	12	318	3	3	3	756
Fox, Victoria Lynn	Instructor				15	15	558	15	15	372				930
Gavin, Jared	Asst. Prof. Math & Phys.	New Hire, August 2012												0
Lynde, Lowell	Assoc. Prof.				12	12	279	12	12	174	6	6	69	522
Nelson, Guy	Instructor	3	3	18	21	18	432	15	15	318				768
Ryburn, Victoria**	Instructor	6	6	30	18	18	606	12	12	309				945
Sayyar, Hassan**	Assoc. Prof.	6	6	54	15	15	216	9	9	114				384
Belvin, Rebecca	ECHS Adjunct				9	9	144	12	12	279				423
Gorman, Regina	ECHS Adjunct				9	9	210	9	9	240				450
Martin, Teresa	ECHS Adjunct				6	6	96	6	6	93				189
Ross, Shelvia	ECHS Adjunct				5	5	15							15
Total		15	15	102	160	157	4007	138	138	3036	24	24	189	7334

** Received a one course reduction in Spring 2012 for writing textbooks and workbooks
ECHS = Early College High School

Program Resources

1. *Describe the institutional support available for faculty development in teaching, research, and service.*

The University offers a variety of support in these areas. In the area of teaching, faculty are encouraged to seek areas of special interest and, when possible, teach in those specific areas. Faculty members are encouraged to develop special topics courses, which may later become part of the regular curriculum if it fills a need. Faculty members are supported with institutional training, and possibly financial incentives, for those wishing to develop on-line or hybrid courses. The University also provides technical support for those wanting to use instructional software such as Blackboard™ in their courses. All of the classrooms in the Science Center are equipped with a computer, a document camera, and a projector, and all Mathematics faculty utilize this technology in their classroom instruction. The faculty are encouraged to attend professional meetings to enhance their teaching skills or their work in other scholarly activities.

The School of Mathematical and Natural Sciences may support faculty research and scholarly activity by granting course relief or sabbatical leave. Faculty are encouraged to write text books and generate new methods of teaching using technology and materials, and can further their research. Math faculty are continually researching new trends in education, new software products, and new mathematical tutorial programs, and upgrading the text books that they have written. Faculty research grants are available through the University on a competitive basis for funding basic research. These grants can even pay students a stipend for their work on projects with faculty members. Several of the faculty members in Mathematics scholarly activity is related to training of teachers and working with the teachers in the public schools.

Faculty are encouraged to serve on the university committees and the math faculty are very active in this regard. Faculty members use their experience and specific skills serving on committees. This provides a growth opportunity for faculty members and the university appreciates the services. Math faculty are also active in service to the community, providing their expertise to variety of areas.

2. *Describe the professional development of full time program faculty over the past two years including the institutional financial support provided to faculty for the activities.*

The School of Mathematical and Natural Sciences provides $6600 budget for faculty development. A portion of the money is used by Mathematics faculty each year to attend professional meetings. The development funds spent in Mathematics during the last two academic years is shown below.

Table 6. Mathematics Faculty Development Funds, Academic Years 2011 & 2012				
Date	**Faculty**	**Description**	**Location**	**Amount**
10/28/10	Mr. Lowell Lynde	Attended National Council of Teachers of Mathematics Meeting (Presented)	New Orleans, LA	$532.89
10/28/11	Mrs. Linda Chapman	Attended National Council of Teachers of Mathematics Meeting (Presented)	New Orleans, LA	$692.75
01/05/11	Dr. Charles Dolberry	Attended the 2011 Joint Meeting of the MAA and AMS.	New Orleans, LA	$507.24
01/05/11	Dr. Hassan Sayyar	Attended the 2011 Joint Meeting of the MAA and AMS.	New Orleans, LA	$161.39
01/05/11	Dr. Farrokh Abedi	Attended the 2011 Joint Meeting of the MAA and AMS.	New Orleans, LA	$642.56
11/3/11	Mr. Lowell Lynde	Attended National Council of Teachers of Mathematics Regional Conference (Presented)	Albuquerque NM	$1,147.74
3/29/12	Dr. Charles Dolberry	Attended the 2012 Joint Meeting of the MAA and AMS.	Arkadelphia, AR	$228.01
3/29/12	Dr. Hassan Sayyar	Attended the 2012 Joint Meeting of the MAA and AMS.	Arkadelphia, AR	$233.88
3/29/12	Dr. Farrokh Abedi	Attended the 2012 Joint Meeting of the MAA and AMS.	Arkadelphia, AR	$392.64

3. *Provide the annual library budget for the program or describe how library resources are provided for the program.*

Each academic unit, along with library liaisons recommends library purchases of materials. The budget is spent on books, e-books, journals, e-journals, and databases. The total budget for the entire School of Mathematics and Natural Sciences is $15,000; however, the budget isn't split into amounts spent for each department. Periodically, the library liaisons contact the School of Mathematical and Natural Sciences and seek guidance on new materials for the library. They also ask for advice concerning removal of obsolete material, old editions of books, or physically damaged material. Electronic databases are upgraded regularly giving faculty an excellent access to new publications. The library also offers a very liberal library loan policy allowing each faculty one or more free library loan requests.

4. *Describe the availability, adequacy, and accessibility of campus resources (research, library, instructional support, instructional technology, etc).*

The School of Mathematical and Natural Sciences attempts to provide latest technology for instruction. Every classroom in the Science Center is equipped with a computer, a document camera, and a digital projector. Eight of the ten classrooms are connected to the internet. The remaining two rooms are in the process of being wired. The Science Center Computer Lab and Tutor Center receives occasional computer upgrades, and was upgraded in the 2011 with computers that Information Technology says should provide excellent service for a minimum of 5 years. Information Technology (IT) provides Microsoft™ software packages, SAS™ Statistical Software, and other needed software on request. IT continually works with the Mathematics faculty to make sure that students and tutors have access to the latest versions of the educational software (ALEKS, WebAssign, MyMathLab) being used in the courses. IT also provides support for Blackboard™, which is available for every course offered on our campus or on-line.

The UAM Library features a large volume of content for faculty research and development, and can also be used in instructional technology. Library resources in the area of mathematics are extensive and include

I. Periodical and Book Titles:
   679 online periodical titles, 6 printed periodicals, 40 eBooks, and 3,908 Mathematics titles in print.
II. Electronic Resources by Subject
   A. Specialized Databases
      1. *ScienceDirect (Elsevier)*

         An online journal collection that provides access to journals covering scientific, medical, and technical information published in 24 fields of science

      2. *SpringerLink*

         An online journal collection that provides access to scientific, and medical journals

   B. General Databases
      1. Academic Search Complete
      2. ArticleFirst
      3. Credo Reference Online
      4. FirstSearch Databases
      5. LexisNexis Academic
      6. MasterFILE Premier

7. *ProQuest Research Library*

III. Bibliographic Instruction

A professor may contact the library liaison to schedule a class period in which the librarian teaches students about resources that will be most helpful in their classes. Students can also request individual research consultations with a librarian.

5. *Provide a list of program equipment purchases for the last three years.*

Table 7 . Equipment Purchases for the Past Three Years	
Date	**Item Description**
July 2012	Livescribe™ 8 GB Echo Smartpen Pro
June 2012	Dell Optiplex 990 Desktop Computers (7 purchased for Math faculty offices)
December 2011	Dell 2230d Laser Printer
August 2011	Avervision™ 300AF Document Camera (2 purchased for classrooms)
August 2011	Dell 1130n Laser Printer (connected to faculty network)
August 2011	Dell E170SB3 Flat Panel Monitor for faculty member
July 2010	Dell Optiplex 960 Desktop Computer (for classroom)
June 2011	Dell Optiplex 990 Desktop Computers (10 purchased for Computer lab)
July 2010	BACK-UPS 550VA Backup Power Up Supply (for classroom)
May 2010	PBC-UMS Universal Projector Mount (for classroom)
May 2010	Dell 1210S Projector (for classroom)
May 2010	Avervision™ 300AF Document Camera (replacement for classrooms)

Instruction via Distance Technology

The School of Math and Sciences strongly feels that face-to-face course instruction is far superior to on-line or even Compressed Interactive Video (CIV) courses. We have purposely avoided offering upper level mathematics courses using this medium. It is our opinion that we cannot be everything to everyone; therefore we have focused our attention on providing top-notch face-to-face courses for our students. Faculty members are not discouraged from developing on-line or hybrid courses; however, very little has been done in this area. An attempt was made to offer a hybrid course in College Algebra in Fall 2012; however, when students discovered that all exams were given in class, they were no longer interested in taking the course.

The following questions are answered based on University policies, but are not applicable to this program.

1. *Summarize institutional policies on the establishment, organization, funding, and management of distance courses/degrees*

The UAM campus governance and academic approval processes are followed for any new course added to the curriculum. Any new degree program, regardless of the method of delivery (distance technology or not) must be reviewed by the faculty, approved by the academic unit dean, the Academic Council, Assembly, Chancellor, the University of Arkansas Board of Trustees, and the Arkansas Department of Higher Education Coordinating Board prior to implementation.

For an existing course to be offered via distance delivery, a Course Shell Authorization form must be completed and signed by the faculty member and approved by the academic unit dean and the Provost. Each faculty member who teaches an online course must participate in Blackboard, the campus learning management system, training offered by the UAM Office of Academic Computing prior to each fall semester, or as the need arises. Technical assistance is provided by the Office of Academic Computing as needed/required throughout the semester and/or term.

The UAM Office of Academic Computing is responsible for the management and maintenance of the learning management system server and must communicate with the Office of Academic Affairs regarding available space/seats and other administrative concerns. Additionally, the Office of Academic Computing is responsible for providing technical assistance to the faculty who teach online courses.

2. *Summarize the policies and procedures to keep the technology infrastructure current.*

University of Arkansas at Monticello faculty and students have access to infrastructure and technology that includes intranet, Blackboard, Compressed Interactive Video, broadband Internet, and access to the online catalog, electronic books, and journals available in the Fred J. Taylor Library and Technology Center, as well as web-based mediums. Regular funding is part of an ongoing process that includes technology upgrades, software licensing, and technical support.

UAM is also in the sixth year of an eight-year plan to provide a technology infrastructure that will increase the University's academic competitiveness. This plan includes Level One technology certification for five buildings; remaining buildings on all three campuses will be upgraded to Level One within the next three years.

In the summer of 2010, UAM, a founding member of the Arkansas Research and Education Optical Network, ARE-ON, connected to the ARE-ON Network allowing access to two high-speed national networks, the Internet2 and National Lambda Rail. Completion of this project allowed UAM to collaborate with all universities and colleges that share the network as well as accessing the Internet at a much faster rate. We are currently in process of getting buildings connected.

UAM has also purchased a financial and student information software system, PeopleSoft, updating the institution's 25-year old software system, which will make secure access to campus educational and planning resources available to students via the Internet.
UAM began offering distance education courses in 1999 with WebCT, and utilized various versions of WebCT until summer 2010, when UAM changed over to Blackboard as its distance learning course management product of choice.

3. *Summarize the procedures that assure the security of personal information.*

The UAM Information Technology Department sets forth guidelines for the protection of personal information following the information security policies regulated by the State of Arkansas security recommendations. These guidelines state that UAM can only collect personal information through a secure link and with prior approval from that individual. Personal information cannot be stored on the course management system by the students and/or faculty. The Office of Academic Computing regularly scans web sites for the presence of personal information. The removal of any personal information found on the course management system is immediate. The Learning Management system (Blackboard in this case) is subject to the same security measures as all other Information Systems on the UAM campus and meets the State of Arkansas security guidelines for protecting personal information.

4. *Describe the support services that will be provided to students enrolled in distance technology courses/programs by the institution and/or other entities:*
   - Advising
   - Course Registration
   - Financial Aid
   - Course Withdrawal
   - Email Account
   - Access to library Resources
   - Help Desk

Online students receive the same advising support as students taking courses on-campus. Advisors are available via published contact phone numbers and email and are always ready to help students with preparing for registration.

In regard to course registration, students who are registering for only online courses are directed to contact the UAM Office of Academic Affairs for support and assistance.
For financial aid for distance education students, students may complete the Free Application for Federal Student Aid (FAFSA) online and can view their financial status via WeevilNet (UAM enterprise computer portal). UAM does not currently allow students to accept aid via WeevilNet; however, that is planned for the near future. Requested verification documents, loan requests, and award acceptance letters can be submitted via mail, email or fax rather than through a personal visit.

In regard to course withdrawal, students are directed to contact the institution's director of Academic Advising for support and assistance.

Student email accounts are governed by the University Information Technology department. The UAM webpage contains links to connect to email, tutorials on using the email system, instructions for initial login, and support phone numbers to contact in the event students are unable to login to their email. Information Technology is open 8am-4:30pm Monday-Friday for student email account problems.

Online students may access library resources in the same fashion as other students. The Library website is linked off of the main UAM homepage, and provides distance education students access to Subject Guides, Library Guides, the Library catalog, an extensive list of databases, and a tool for searching magazines, newspapers, and journals for information. The Library webpage also provides contact information should students need specific services that are not linked to the main page.

The Office of Academic Computing features a Support Center, also linked off the main UAM Webpage (Blackboard link). This link allows students to access tutorials on "How to Use Blackboard" and "Problems with Blackboard" for students to reference for quick resolutions. The support page also features contact phone numbers for the Support Center, a form to complete to request assistance via email, and a "Live Chat" option where you can be directly connected to an individual in the support center for live assistance. The Office of Academic Computing also periodically offers workshops on Blackboard usage.

5. *Describe technology support services that will be provided to students enrolled in distance technology courses/programs by the institution and/or other entities.*

Support services are provided to students enrolled in distance technology courses primarily by the Office of Academic Computing. Faculty are also very helpful if it is an issue they are familiar with to help share resolutions. The Office of Academic Computing supports distance technology courses with training workshops on how to use the course management software utilized for distance courses (Blackboard at this time), online tutorials, email forms for support, and by providing contact phone numbers for the Support Center, and a web option for Live Chat with support personnel. The email form, the chat option, and direct phone calls put users in contact with support personnel who gather information about the users' computer, Internet connection, and the problem. Using this information, support personnel will attempt to diagnose the issue and provide a timely resolution to the problem.

6. *Describe the orientation for students enrolled in distance technology courses/programs. Institutional policy in regard to orientation for distance technology courses is as follows (from UAM Faculty Distance Education Handbook)*

"Conduct an orientation (online) in each course at the beginning of each term to ensure each student understands the requirements of the course and can access the course. Advise students of the time and energy demands of the course as well as establishing clear limits on what the course is and is not."

Each faculty member interprets this orientation process in a slightly different manner, but all complete the requirements to ensure students understand how to use the software, view the syllabus, utilize the calendar and discussion boards, and other software features. For the Advanced Microcomputer Applications course, there is an on-campus orientation session where the instructor covers the basics of Blackboard, homework requirements, and testing dates are presented in person. Each style of orientation session presents the instructors contact information, office hours, and expectations for student performance in the course.

7. *Summarize the institutional policy for faculty course load and number of credit hours taught, compensation, and ownership of intellectual property.*

In regard to faculty course load, again referring to the UAM Faculty Handbook,

"The course load for fulltime faculty holding the rank of instructor is 15 semester credit hours. The course load for fulltime faculty holding the rank of Assistant Professor or above is 12 semester credit hours."

Distance education courses are treated as part of faculty's standard workload. Thus, distance technology courses are viewed the same as classroom courses in the area of workload, credit hours taught, and compensation. Faculty is given a special one-time incentive payment for development of each new online course that they teach.

In regard to ownership of intellectual property in the area of previously copyrighted materials, the UAM Distance Education faculty handbook sets forth the following guidelines for the use that all faculty must abide by:

"Under Section 107 of the copyright law (www.lcweb.loc.gov/copyright) passed in 1976, educators are given special exemptions from the law under the Fair Use Doctrine (http://fairuse.stanford.edu). Educators may use copyrighted works without first obtaining permission of the copyright holder, within limits. There are four criteria for determining whether copyrighted materials have been used legally under this doctrine:

(1) Purpose and character of the use;
(2) Nature of the materials used;
(3) Amount and importance of the part used; and
(4) Effect on the market of the use.

This site (www.cetus.org/fairindex.html) shows illustrations of the amounts of copyrighted work that may be used under the Fair use Doctrine.

<u>Copyright and Online Instruction</u>

The Technology, Education and Copyright Harmonization Act (TEACH Act) passed in 2002 expands the Fair Use Doctrine to cover distance education. Generally, exemptions given for face-to-face instruction will apply to online instruction. Please visit the American Library Association website for more information.

Copyright Permission

The Fair Use Doctrine currently enables educators to use copyrighted materials without first seeking permission. An educator can also use any materials where copyright permission has been obtained. The following sites offer more information.

- The Copyright Clearance Center (www.copyright.com) will obtain permission for educators; a fee is attached to this service.
- The Copyright Management Center at Indiana University/Purdue University site has information on how to seek copyright permissions. (http://www.iupui.edu/~webtrain/web_samples/cmc.html)
- The US Copyright Office (www.lcweb.loc.gov/copyright) allows one to search a database for copyright ownership."

In regard to course ownership of intellectual property developed by University faculty, please refer to attached Appendix F – University of Arkansas Board of Trustees Policy 210.2 regarding course ownership. In summary, this policy states that in most instances, faculty will own the copyright to material they have created, and retain the right to update, edit, or revise their work. Faculty also will receive all revenues of commercialization of content they create of their own initiative. For materials developed in regard to faculty contract employment pursuits, the University will retain the right for all revenues, but may decide to share such revenues with the developer at the discretion of the University.

Majors/Declared Students

1. *State the number of undergraduate/graduate majors/declared students in each degree program under review for the past three years.*

The number of declared Mathematics majors over the past three years has remained fairly constant at near 20 majors. Typically, there are more freshmen Mathematics majors than any other year; however, a number of those students change their major prior to their sophomore year. The numbers remain fairly constant for the remaining three years. The table below shows the number of mathematics majors per class over the past three years.

Table 8. Declared Mathematics Majors

Fall of	2009	2010	2011
Freshmen	5	7	9
Sophomore	5	5	3
Junior	5	3	5
Senior	5	5	4
Spec/Post BS	0	0	1
Total	20	20	22

2. *Describe strategies to recruit, retain, and graduate students.*

As part of recruiting, the School of Mathematical and Natural Sciences have developed relationships with area high school mathematics teachers. Mathematics faculty members occasionally make trips to local high schools to present mathematics topics to math classes. Also the high school teachers with their junior and senior level students are invited to visit and sit in various math classes. These activities will give faculty an opportunity to market the University, and our major in particular.
The School of Mathematical and Natural Sciences also recruits potential students during their visit in events such as Scholar's Day, Weevil Welcome Days, and Parent/Family Appreciation Day. The Office of Admissions does an outstanding job of identifying top-notch students with skills in mathematics, and forwarding their information to our office. Prospective students receive a contact letter describing Mathematics program and an invitation to visit our school for further information concerning the Bachelors of Science degree in Mathematics.

UAM hosts three Advanced Placement (AP) test prep sessions each year in Mathematics. Approximately 200 local high school students that are enrolled in AP Calculus or AP Statistics visit our campus with AP trainers on the three Saturday events. During breaks, faculty and representatives from the Office of Admissions speak with students about Mathematics opportunities at UAM, and even other universities.

The undecided General Studies majors are given information on job opportunities by their math instructors and encourage them to consider continuing their study of mathematics and/or sciences. Also the math faculty recruit the students interested in mathematics through the members of Sigma Theta and Math and Physics Club within our school.
To retain and graduate students, a large amount of emphasis is placed on academic advising. Every semester, each major must meet with their academic advisor prior to enrollment in classes. The advisors carefully plan the sequence of courses so that the students can graduate at their desired date. After the student reaches 70 hours, the advisor and student must submit an Advisement Report (formerly called a degree audit) and a degree completion plan to the Registrar's Office.

Free mathematics tutoring is available in the department for students that are struggling, even in upper level courses. Many Mathematics upper level majors earn work-study wages by working in the tutoring lab. This helps the students be able to handle the financial burden of college, while improving their mathematical skills.

The Mathematics faculty spend an enormous amount of time providing help sessions or working one-on-one with students during office hours. They also work with students that are dealing with personal problems or other issues that may prevent them from being successful. During the student's last year of undergraduate work, the faculty help the students get placed in a local school for the Master of Arts in Teaching (MAT) program. Even after graduation, the faculty often act as mentors for students in the MAT program.

3. *Provide the number of program graduates over the past three years.*

The number of graduates in Mathematics averages about 4-5 students per year, with a ten year average of 4.7 graduates per year. Over the last three years twelve students have graduated, even though there were zero graduates in 2011. There were several students in that class that should have graduated in 2011 that were one or two courses short of completing their degree and had to attend summer school or return in the fall. In some of these cases, it was a failure to complete a general education course, or a supportive requirement that prevented them from graduating in in May 2011. Those students were included in the 2012 graduation list. The following table shows the number of program graduates per year over the past three years.

Table 9. Mathematics Graduates per Year for the Last Three Years					3 year mean
Year	2010	2011	2012	Total	
# Graduates	4	0	8	12	4.0

Program Assessment

1. *Describe the program assessment process and provide outcomes data (standardized entrance/placement test results, exit test results, etc.).*

The School of Mathematics and Natural Sciences uses four primary means for assessment of students as they work through the program and as an annual assessment of the program itself.

First of all, students are evaluated by course examinations and projects to measure their learning. Exams cover material from the textbooks, instructor lecture, or activities completed during the course. In some classes projects and/or homework files are opportunities for the students to display their understanding of the concepts taught in the course as part of the grading component.

Secondly, senior students often take a standardized exam involving mathematics. Most take the Praxis II Math exam which is specifically over mathematics content. Others may take the GRE, but rarely does anyone take the Mathematics subject exam since most graduate programs require only the general GRE exam. Recent Mathematics Praxis scores are shown in the table below.

Table 10. Praxis Exam Results for UAM Master of Arts in Teaching (MAT) Students that have taken significant portion of Undergraduate Math at UAM 2010 - Present						
Praxis Test Identification			Math Proofs Models Problems Part 1	Math Content Knowledge	Praxis I Mathematics	Mathematics Pedagogy
Minimum Passing Score			144	125	171	135
Last Name	First Name	MAT Completion Year				
Gilmore	Sheila	2010	145	125	187	140
#Earnest	April	2011	159	144	185	140
#Matthews	Shalonda	2011	162	135	185	150
#McBay	Gia	2011	150	145	187	150
#Wade	Adam	2011	168	160	187	155
#Cook	Mary	2011	151	134	188	145
Keith	Jack	2011	149	127	181	155
Roberts	Thomas	2012	Not taken	125	180	145
#King	Haley	In program	200	178	Passed*	Not taken %
#McCarty	Cash	In program	177	162	Passed*	Not taken %
#McKewen	Charles	Withdrawn	144	135	Passed*	Not taken %
# indicates Mathematics major					*No score reported	% Test will be taken in 2013

Thirdly, Mathematics Seminar, MATH 4711, is the capstone course required of all Mathematics majors. One goal of this course is to validate the student’s mathematics background through the development of a research presentation in which the student applies previous knowledge to a topic that wasn’t specifically taught in the curriculum. 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. Some of these students also present their work at a state, regional, or national teachers meeting. This year, six students took Mathematics Seminar. This group was very strong compared to past years, and all students performed very well and easily met the desired learning outcomes.

Finally, our program is assessed by placement of the graduates. Most of our graduates are successful in finding teaching positions (which also implies they have sufficient Praxis II Math scores). Other have attended graduate programs, and a few have gone into private business or industrial positions. A few have chosen to be a stay-at-home mom and not pursue a career despite being a very successful student. A graduate placement list is shown in Appendix G.

Our program undergoes an annual assessment reporting process whereby faculty assess the program on the basis of student learning outcomes and how they relate to the mission of the University, student performance and evaluation, and program efforts in the area of student retention. This report is submitted to the Provost each August.

A large amount of effort has been placed on the assessment and improvement of the remedial and General Education Mathematics courses. The following paragraph is taken from the Mathematics and Natural Science 2011-2012 academic year assessment report, and is very typical of the results seen in previous years.

> Essentially all entering freshmen students are placed into Introduction to Algebra, Intermediate Algebra, or College Algebra or higher based on their performance on the ACT exam, or equivalent placement exam. In accordance with state law, a post-test is given at the end of the Intermediate Algebra course. UAM has selected the ASSET exam as the end of course exam. Almost every student enrolled in Intermediate Algebra initially scored below a 19 on the ACT, or equivalent on a comparable exam. An ACT math score of 19 is needed to enter college level math courses. In the Fall 2011 Intermediate Algebra courses, 143 out of 322 students initially enrolled took the ASSET test as the final exam. Of the 143 that took the test, 93 scored the equivalent of a 19 ACT, or above (93/143 = 65% passing). There were 32 students that scored high enough on the ASSET exam to move on to College Algebra despite having a D, F, or W, as a grade in the Intermediate Algebra course. These students were tracked into the Spring 2012 College Algebra and Survey of Math courses, and it was found that of the 32 that were allowed the opportunity to move on to college level math, only 18 actually moved up. Of the 18 that attempted college math, there were 7 F's, 3 W's, 4 D's, 3 C's, and one B. It is clear that passing the exam does not necessarily indicate preparedness for the next course in sequence. The Spring 2012 Intermediate Algebra courses had 83 of 122 test takers scoring a math score equivalent to 19 ACT (68% passing). There were 242 students originally enrolled in the course. The percentage of students passing the ASSET exam was somewhat lower than the success rate in the previous year (83%). This is attributed to the fact that several students stayed in the course hoping that a sufficient ASSET score would enable them to take a college level math course, despite a failing grade in Intermediate Algebra. Initially essentially none of the students possessed scores that would allow them to enter a college level math course. Overall, approximately two-thirds of those taking the end of course ASSET exam scored proficient and were allowed to move on to college level math courses. Although UAM has a large number of students withdraw from the course, or are walk away F's, the students who complete the course perform exceptionally well on the nationally recognized exam. When compared to the unofficial results from other universities in the state at the Arkansas Math Chairs meeting, UAM students perform very well. Arkansas Department of Higher Education has not released official numbers reported from all colleges.

2. *Describe program/major exit or capstone requirements.*

MATH 4711, Mathematics Seminar, is the capstone course for the Mathematics major. This course provides students with an opportunity to use concepts previously learned in their curriculum and apply creativity and critical thinking to a project in the development of a paper and oral presentation. The objectives of the capstone course are:

1. To provide an overview of the mathematics the student has studied;
2. To improve the student's written and oral communication skills;
3. To acquaint the student with the basic library research techniques in mathematics;
4. To validate the student's mathematical background.

The course requires that each student conduct library research on a specific mathematics topic. The instructor must approve the chosen topic. The student should search through the mathematics literature and gain detailed knowledge of the topic. The student is required to submit a word processed report with references, and to give a thirty to fifty minute oral presentation on the topic. By going through this, the student obtains experiences that better enable her or him to enter the job force with confidence; and to demonstrate higher level communication and mathematics skills. The grade awarded is based on the student's ability to organize important information, provide adequate coverage of a topic, and to complete a written report and an oral presentation.

Students that plan on entering the teaching field often choose topics from MATH 3233, History of Mathematics as part of the seminar preparation. In this course, they are required to read a biography or one or more famous mathematicians, write a paper summarizing their readings, and make an oral presentation to their classmates and Math faculty. Often, Mathematics Seminar students will take this earlier work and add information from modern journals on a related topic to develop their final seminar project. Their paper and presentation will be far more in depth than their original work.

3. *Provide information on how teaching is evaluated, the use of student evaluations, and how results have affected the curriculum.*

Teaching evaluation is one of the main components of the faculty evaluation process. This is done by classroom observation by the Dean of the School of Mathematical and Natural Sciences and/or peer faculty, and by student evaluations.

The classroom observance portion of the evaluation process focuses on faculty's preparation and organization in the classroom, knowledge and presentation of the content, and communication and interpersonal relationship skills. This evaluation gives the reviewer a chance to provide constructive criticism on teaching performance and suggest possible improvements. Please refer to Appendix H for the Classroom Visitation Form

Student evaluations are an important means of feedback on the instructor's performance, the course content, and an opportunity to provide valuable comments and feedback for possible improvements in the course. Students are first asked to evaluate themselves as a student, thus providing some context for their input in regard to their classification, effort level, attendance, projected grade, and academic history. Students next evaluate the instructor on material presentation, teaching performance, and effectiveness. After evaluating the instructor, the student evaluates the course itself in the areas of content, testing, assignments, and textbooks. Student input is valuable in both the faculty evaluation process and feedback on the courses themselves.

Student evaluation of courses is an important part of the process whereby the faculty review our curriculum. Student written comments in particular can provide valuable insight that faculty can consider for changes in course content or curriculum, or the possible creation of new courses.

In the past year, our student evaluation of teaching has been moved to a secure online survey operated by CoursEval. The students complete the new survey outside of class. In the old process, the 34 question survey with a blank page added for written comments was used and the details of the questions were described above. While the 34 question format provided some detail, it was evident in reviewing evaluations that if a student liked a faculty member, they marked all ones, and if they didn't like the faculty member, they marked all fives, with other students somewhere in the middle. Much of the information gathered on specific questions was lost due the fact that student evaluations were done in class and sufficient time was not allowed to provide thoughtful responses. In the new system, the survey has been simplified greatly to 6-8 specific questions, with opportunities to include written comments on some of the questions. In the survey, statements are made and the student has the opportunity to Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, or Strongly Disagree. The survey statements used on the Spring 2012 evaluations are:

1. I have more knowledge and a deeper understanding of the subject matter as a result of this course.
2. (A written response question) What did you like and dislike most about this course?
3. The instructor is willing to help the students learn.
4. The instructor shows interest in and knowledge of the subject.
5. The instructor demonstrates effective oral and written communication skills.
6. I would recommend this instructor to other students.
7. The instructor follows course policies as stated in the syllabus.
8. The online homework used in this course was helpful.

Question number 8 was added by the Dean of Mathematics and Natural Sciences to courses that were using the ALEKS online homework and assessment package. Due to the student response on this question, the Mathematics faculty have decided to review other software packages, such as MyMathLab, and WebAssign to see if they can provide a more synchronized package for the workbooks and texts.

Faculty use the written response question to make minor changes in their policies and course content. Student evaluation comments were the initial catalyst in getting the combined Calculus III and Differential Equations split into two separate courses.

4. *Provide transfer information for major/declared students including the receiving institutions for transfer and programs of study.*

Incoming transfer students are welcomed to the program. Their transcripts are analyzed by one or more faculty members, and determinations are made on which major requirements have been adequately fulfilled. There have been very few transfer students entering the program, and most of those have had very few courses in Mathematics above the general education core. The faculty are familiar with the other in-state programs and can efficiently evaluate the transcripts for students from those institutions. For other universities, the Registrar often supplies catalog information to the Mathematics faculty to help in placement. Course substitutions are allowed when appropriate.

The Mathematics program does not serve as a feeder for specific programs at other institutions, so we rarely have a program student transfer to another university. The pre-engineering students typically take Calculus I, Calculus II, and Differential Equations prior to transfer. Those courses have been previously approved for transfer into engineering programs at Louisiana Tech University, Arkansas State University, Arkansas Tech University, and University of Arkansas at Fayetteville.

5. *Provide information for program graduates continuing their education by entering graduate school or by performing volunteer service.*

Often, curriculum changes that occur are due to meeting requirements to enter a graduate program. It is our goal to provide a program that is sufficiently broad to allow students to enter graduate programs (either Master of Arts in Teaching (MAT), or a traditional Mathematics program). Over the past three years, seven students have entered the MAT program at UAM or other universities. One has been accepted into a M.S. program in Mathematics, and one that was a Mathematics/Chemistry double major is in a M.S. program in Forensic Science. The faculty work closely with our seniors to help them through the applications process, and help them make choices that best fit their skills and goals.

6. *Provide aggregate results of student/alumni/employer satisfaction surveys.*

Eight program courses, Calculus I, Calculus II, Calculus III, Differential Equations, Linear Algebra, Discrete Mathematics, Abstract Algebra, and Reading & Research in Mathematics were chosen from the Spring 2010 to Fall 2011 cycle for comparison. For classes taught more than once, only one course was chosen for inclusion. The survey is broken into three question groups. The first section is related to student self-evaluation; the second section is related to instructor evaluation; and the third is evaluation of the course. For comparison sake, the School of Math and Science averages on most questions are near 2, or slightly higher. Most faculty consider questions 24 and 34 to be the most important questions of the survey.

Student Evaluation of Teaching Results

Student Self-Evaluation

1.This course is -- 1=Required, 2=Elective, 3=Audit

Values expressed in Mean Responses

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.11	1.18	1.00	1.00	1.50	1.33	1.00	1.67

2. My current UAM grade point average (GPA) --------------------------- A B C D E

A	B	C	D	E
3.6-4.0	3.1-3.5	2.6-3.0	2.0-2.5	0.5-1.9

Values expressed in Mean Responses – A=1 B=2 C=3 D=4 E=5

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.22	2.00	1.60	2.29	1.67	1.83	2.17	1.33

3. I am presently a -- Fr So Jr Sr Other

Values expressed in Mean Responses – Fr = 1, So=2, Jr = 3, Sr = 4, Other = 5

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.11	3.00	3.60	3.00	3.43	3.33	2.50	3.50

4. Number of times I was absent from this class -------------------------------- 0 1 2 3 4+

Values expressed in Mean Responses – 1=0 absences, 2=1 absences, 3=2 absences, 4=3 absences, 5= 4+ absences

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
3.00	3.09	2.20	2.00	1.17	2.00	2.67	1.83

5. Estimated weekly hours I spent studying for this course -------------------- 0-2 3-5 6-8 9-11 12+

Values expressed in Mean Responses – 1= 0-2 hours, 2=3-5 hours, 3=6-8 hours, 4=9-11 hours, 5=12+ hours

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.33	2.36	2.60	1.71	1.67	2.00	1.83	1.67

6. My final grade in this course will probably be --------------------- A B C D F

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.78	2.09	1.60	1.57	2.00	1.67	1.83	1.67

For questions 7-32, responses are on the following scale	**Excel-lent**	**Very Good**	**Good**	**Fair**	**Poor**
	A	B	C	D	F

7. My class participation was --- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.33	2.00	2.20	2.29	2.50	2.33	2.67	2.83

8. My interest in taking this course before I enrolled was--------------------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.22	2.64	2.40	2.71	2.33	2.67	1.67	3.00

9. My current interest in this course is-- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
3.11	2.55	2.40	2.86	3.00	2.33	1.67	2.67

10. Amount I have learned-- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.44	1.64	1.60	2.29	2.60	1.83	1.67	2.00

Instructor Evaluation

11. Explains subject matter so that I understand---------------------------------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
3.11	1.91	1.80	2.86	2.50	1.67	1.83	1.50

12. Speaks clearly--- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.56	2.09	2.00	1.86	2.20	1.83	1.67	1.67

13. Demonstrates knowledge of subject--- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.78	1.64	1.60	2.57	2.17	1.33	1.50	1.33

14. Uses appropriate teaching aids effectively------------------------------------ A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.22	1.45	1.80	3.14	2.67	1.67	1.50	1.33

15. Promotes independent thought while offering proper guidance----------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.22	2.00	1.60	2.57	3.00	1.67	1.67	1.50

16. Encourages effective communication skills---------------------------------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.33	2.18	1.80	2.71	2.83	1.83	1.83	1.17

17. Is well prepared for class--- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.78	1.64	1.60	3.43	2.50	1.50	1.67	1.00

18. Is available for help during posted office hours------------------------------ A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.56	1.18	1.20	1.86	2.17	1.50	1.33	1.17

19. Shows concern for students-- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.33	1.18	1.40	2.00	2.67	1.33	1.83	1.33

20. Increases my desire to learn more about the subject------------------------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.67	2.18	1.80	3.14	3.17	2.00	2.33	1.50

21. Comments on my work (tests/assignments) in ways that help me to learnABCDE

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.33	1.91	1.20	2.86	3.00	1.50	1.83	1.33

22. Shows interest in subject matter--- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.56	1.55	1.60	2.29	2.00	1.50	1.33	1.17

23. Establishes relevance of subject matter-- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.11	1.45	1.60	2.71	2.50	1.50	1.67	1.67

24. Overall effectiveness as a teacher--- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.33	1.82	1.60	2.57	3.00	1.50	1.50	1.17

Course Evaluation

25. Goals and objectives clearly stated and are being accomplished----------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.89	1.73	1.60	2.29	2.50	1.83	1.67	1.83

26. Course content organized--- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.33	1.55	1.80	2.29	2.33	1.50	1.67	1.67

27. Exams based on lectures and assigned materials----------------------------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.89	1.36	1.60	2.00	2.50	1.33	1.67	1.50

28. Exam questions clearly written-- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.11	1.55	1.40	2.00	2.50	1.50	1.83	1.33

29. Grading procedures based on criteria in syllabus---------------------------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.78	1.45	1.40	1.57	2.17	1.67	1.50	1.33

30. Course experiences relevant to subject matter-------------------------------- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.78	1.36	1.80	1.86	2.17	1.50	1.67	1.50

31. Usefulness of textbook-- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.00	1.82	1.60	2.57	2.33	1.67	1.50	2.00

32. Usefulness of outside assignments-- A B C D E

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.891.89	1.55	1.60	3.00	2.33	1.67	2.17	2.17

33. Pace of presentation-- A=too slow, B=OK C=too fast

Values expressed in Mean Responses- 1= A, 2=B, 3=C

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
1.83	1.64	1.80	2.00	2.33	2.00	2.00	2.00

	Excel-lent	Very good	Good	Fair	Poor
34. Overall rating of this course	**A**	**B**	**C**	**D**	**E**

Values expressed in Mean Responses- 1= A, 2=B, 3=C, 4=D, 5=F

Cal I	Cal II	Cal III	Diff Eq	Linear Alg	Discrete	Abstract	Read/Res
2.38	1.73	2.00	2.57	2.50	1.67	1.67	1.83

Each year, graduating seniors are invited to have an exit interview with the Dean of the School of Mathematical and Natural Sciences. Several students promise to come in for a visit, but many do not follow through. This year, two graduating mathematics students did the exit interview. Their responses were very similar to those from previous years. The usual questions asked during the interview and typical responses are found below.

Exit Interview Questions and typical responses

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

Most Common Responses:

2) Grew up locally, didn't want to go far away. Have family that work in this area. Came because of athletics.

3) Most rank either 4 or 5. Occasionally someone ranks a 3. No student gave ranking of 1 or 2.

4) Small classes. Get to know professors and other students very well. Cheap. Lots of work study opportunities. Lots of friends here. I learned a lot.

5) Upper level courses not offered often enough. Not big enough to avoid course conflicts with

multiple sections of some courses. Nothing to do here socially.
6) Most answer yes. Those that answer no usually indicate it is for non-academic reasons (lack of social life is most common explanation)
7) Most answer yes. The occasional negative answer is often related to not being able to find a job in the area they wanted after graduation.
8) Reduce the number of labs needed for a degree in sciences. Not teach calculus only at 8:10 a.m. five days a week. More night class offerings.
9) Most say they have no changes. Not require minors to take the lab portion of the courses. Increase the number of upper level options in chemistry and physics.
10) Most say yes. There are a few, especially those that start in general studies, that complain about their first semester advising.
11) This question has a wide variety of replies. Improve buildings. Improve parking lots. Give entire campus wireless access. Build a new entrance to the college that doesn't have to go through Drew Central or Monticello schools. Drop athletic programs. Move the campus into town. Change the mascot. Relax the alcohol rules on campus. Drop the history requirement.
12) Most already have jobs or professional programs in place. A few students planning to teach are too late to enter MAT program, and therefore have to wait a year.
13) Most have specific plans involving family and employment near hometown. A few plan to leave for bigger city.
14) This is most often unanswered

The School of Math and Sciences has not done an employee satisfaction survey in several years; however, we work very closely with the school districts that hire our majors as teachers. We have had no complaints about the ability of our Mathematics graduates teaching in the schools in the area. When reviewing the list of graduates from the last 10 years, Appendix G, you will note that we have teachers in almost every school district in Southeast Arkansas. We often hear that our students are doing an outstanding job. UAM graduates are often praised for their content knowledge. Two years ago, Drew Central High School praised one of our graduates for raising their end of course test scores in the class that he taught to 86% being proficient or above. This year, Hamburg High School has praised us for the outstanding mathematics teachers that we have sent to them over the past few years. They have hired two of our majors and have commented on their outstanding mathematics background. One school official indicated that our first year MAT student was helping the experienced teachers by showing them better ways of presenting material to their students.

Occasionally, we hear directly from alumni. We always ask if they have encountered anything in their profession that would indicate a weakness in the curriculum. Most indicate they have found nothing they would consider a weakness. One graduate, who is now a Mathematics faculty member at a two-year college, indicated that we needed a course in Basic Analysis. This information was passed along to the Mathematics faculty for discussion. Even though we don't have a course by that name in the curriculum, those topics are covered in other courses in our current curriculum.

7. *Describe how the program is aligned with the current job market needs of the state or local communities.*

The entire state of Arkansas is in need of Mathematics graduates. Several high tech industries require graduates from the STEM areas to fill professional level positions; however, few of those industries are in this region of the state. Most of our Mathematics students have the goal of completing their degree in Mathematics, then completing the MAT program to obtain teacher licensure, and staying in the region. The Mathematics major is not slanted toward teaching, but there are specific electives that are recommended for those entering education. The overall degree is very generic and will allow a student to select electives that will give them the best opportunity for success in their planned job. The broad background will allow them to have other options if they choose to change careers.

8. *Provide job placement information for program graduates including the number of graduates placed in jobs related to the field of study.*

Appendix F shows the program graduates for the past ten years with their initial job placement. The largest percentage of our graduates pursued a career in education; however, several have been accepted into graduate programs, and others have taken positions in the private sector.

Program Effectiveness (strengths, opportunities)

1. *List the strengths of the program.*

The major strength in the program is the devotion of the faculty. The School of Mathematics and Natural Sciences has a well-experienced and caring mathematics faculty who are continually searching for better methods to serve the students. Listed below are some of the practices of the mathematics faculty that help our students be successful:

- Some faculty hold office hours in the Computer and Tutoring Center on a regular basis to help students with ALEKS and WebAssign software.
- All faculty provide help sessions prior to each exam in their courses.
- Faculty write practice exams for students in Intermediate Algebra, who are required to take an end-of-course ASSET exam. It is rare for students to not pass the ASSET exam if they have attended 2 or more of the practice exam/help sessions.
- The math faculty have written three workbooks that are currently used in Introduction to Algebra, Intermediate Algebra and College Algebra. Each workbook is closely aligned with an on-line homework and assessment program.
- The math faculty have a unified goal in improving the quality of mathematics teaching in the public schools. Some faculty are writing grants and holding workshops, others are working one-on-one with public school teachers, while others are involved in curriculum development at the state and national level. We understand that improving the mathematics background of the incoming students will improve our program in the long run.

- Most importantly, the faculty spend endless hours working with students outside of class. Students have learned that the faculty will help them, whether they are having problems in a class, or in need of career advising.

A second strength is the strong ties that Mathematics has to the science fields in the School. The entire School of Mathematics and Natural Sciences works together to support the needs of each program. It is very common for faculty from each discipline to work together in curriculum design, in research, or on committees. Informally, faculty from different disciplines discuss when and how topics should be introduced to best support their programs. Members of the Physics department often use Mathematics students in their research. Faculty in Mathematics often serve on Pre-Med committees, which has an outstanding acceptance rate over the last ten years. Mathematics faculty often provide help sessions for the students taking admissions exams, such as the Pharmacy College Admissions Test (PCAT). The Mathematics faculty are involved with, and currently direct, the Southeast Arkansas Regional Science Fair.

2. *List the areas of the program most in need of improvement.*

An important area that needs improvement is the pursuit of scholarly activities outside of teaching. No math faculty members currently have ongoing research projects, nor do any have publications in the past ten years. The only grants that have been sought have been No Child Left Behind grants for doing teacher workshops. An improvement in this area would strengthen the overall program and allow consideration for promotion to the rank of Professor for those faculty.

A second area that needs improvement is staffing. Our current Mathematics faculty not only teach program courses, but also general education and remedial courses. The faculty spend a very large amount of time dealing with students in these courses because they are so often poorly prepared when they enter college. This is one reason that an emphasis has been placed on improving teaching in the public schools. These remedial and general education classes are typically larger than they should be, and the faculty member spends a lot of out of class time with these students. Additional faculty members in Mathematics would make these classes smaller and hopefully improve the success rate in those courses. This would free up time for the current faculty to be more involved with scholarly activities and also make it possible for some of the upper level courses to be offered on a more regular basis.

Another area that needs improvement is in the area of technology. Each classroom has the basic permanently mounted, computer, document camera, and projector. Our students enter the MAT program and are immediately placed in a school district that uses smart boards, Promethean™ display systems with student feedback capability, and other high tech hardware and software. Our students need to experience this prior to entering the classroom. Many of our software packages, such as Maple™, are very old simply because we cannot afford the high cost of upgrading. We make the attempt to have very good computers in our computer lab; however, the Science Center computer lab is small; it has only ten computers. This is inadequate for a reasonable size class to use. Scheduling conflicts for computer labs in other buildings often means that we don't get to use the lab during class time. Our building currently does not offer wireless access to students; however, there are plans to do so within the next two years.

The physical facilities are in great need of replacement. The Science Center continues to break down. There are several roof leaks that not been able to be repaired. The cement steps are breaking apart in several locations around the building. Mold grows very well in the shady overhangs and shaded sides of the building. There is no return air in the labs which have hoods, so lots of air from underneath the building is pulled into the rooms. This has caused major problems with mold growing behind hoods, underneath the lab benches, and under the heating/cooling units. Windows are original to the building. Most do not fit well and allow air and occasional rain tenter the building. None offer any insulation. Since some of the windows are on the walls adjacent to the raised sidewalks, security is non-existent. Many of the windows locking mechanism is rusted to the point of not working at all. One digital projector system was stolen from the Science Center in 2010, from room A-1. Exterior doors offer little security. Frequently rain is blown through the doors. During weather changes more than one door sticks allowing air conditioning to be lost and creating very distracting noises. Multiple work orders have been filed to repair doors; however, essentially no improvements have been made. At times during the past year, certain doors were blocked off due to problems with the doors dragging. Even with its problems, many students think of the Science Center as their second home and hang out in the building between classes. Great efforts have been made to make the Science Center a comfortable learning environment.

3. *List program improvements accomplished over the past two years.*

Continuous growth and improvement of all the programs in the School of Math and Sciences is a goal. Other than small changes, the curriculum has been very stable over the past several years with no major curriculum changes during the last two years. Some improvements have been made in specific courses, such as the development of in-house published workbooks for the remedial and general education courses. The addition of the on-line homework and assessment software packages to several courses has made it possible for students to get immediate feedback while working at home. This will also become a part of the assessment plan for these courses.

A recent emphasis has been placed on assessment of all the Mathematics and Natural Science programs. Within the past year, several faculty members have implemented several assessment methods into their courses, with the most common being pre-test/post-test. Initial results from that assessment will be available for the upcoming Annual Assessment Report.

With so many of the Mathematics majors planning on a career in education, the School of Education has complied with our request for a minor in Teaching and Learning. This provides much needed experience in education prior to entering the MAT program. Although this is not part of the Mathematics program, the request was made specifically to accommodate Mathematics students. The students in the program taking the education courses are very pleased with the minor at this time.

Within the past two years, installation of projectors, document cameras, and computers was completed in the last 3 classrooms in the Science Center. At this point, all classrooms are equipped with the basic equipment for using Powerpoint™ or a document camera in teaching presentations. The last three rooms are currently being wired for internet as well.

The Science Center computer lab was upgraded with new computers with large amounts of memory to better serve those using educational software. The Mathematics tutoring center was moved back to the Science Center. This is better for both students needing help and the tutors.

4. *Describe planned program improvements, including a timetable and the estimated costs. Identify program improvement priorities.*

The School of Mathematical and Natural Sciences has several improvements planned.

The School plans to do a better job promoting all of our majors, including Mathematics. The graduates from the School of Math and Sciences have been extremely successful in their post graduate endeavors. The Mathematics program has produced several outstanding teachers in the community. Others have been quite successful in traditional mathematics graduate programs. Better publicizing our success will aid in recruiting. This is expected to be done very quickly at very low costs. This can be done in part using the Web, or by using traditional media outlets.

More effort must be placed on recruiting top-notch students into the Mathematics program. Based on the Arkansas Department of Higher Education standards, we are barely above the viability line of an average of four graduates per year over a running three year period. The first planned recruiting effort will be to get more of the local students that are taking the Advanced Placement Calculus and Statistics courses to our campus. These students have the ability to come directly into the program and move forward without having to take pre-requisite or remedial course work. We also plan to expand our recruiting area to other regions of Arkansas and expand into the border regions of Louisiana, Mississippi, and Texas. Developing new connections in other regions could take multiple years. The money spent can vary, depending on what we want to do to get into other areas; however, the level of success is most likely going to be directly related to the money spent.

More effort is going to be placed on keeping contact with our graduates. Prior to several retirements in 2007, there was a very good newsletter published in the department. Since that time, no one has wanted to take on the task, and also budget cuts have limited the publishing and mailings that we can do. Re-establishing the newsletter is a high priority for the School of Math and Sciences. It may take one to two years to get the newsletter revitalized. It will likely take about $2000 per year to produce the newsletter and mail to graduates if we keep the current format. If we go entirely to a web based newsletter, costs could be significantly less.

The Mathematics program plans on continued improvements in the area of assessment. We recognize that has been a weakness for several years, and plan to take measures to bring the assessment process up to where it should be. Assessment changes can take several years to implement and see results, but some results should be seen within the first year. The cost for these improvements should be very low in cash; however, could be quite large when figured with man-hours.

The largest improvement planned is for facilities. The building is near the end of its useful life, and architects have recommended that it be razed and a new building built. This will allow for growth, as well as provide a nice learning environment for the students. It will also be a major upgrade in technology for the classrooms and also computer labs. The expected date for the new building is several years away, and the cost is estimated for approximately $25M.