

# **Annual Assessment Report**

**2007-2008**

## **School of Mathematical and Natural Sciences**

The assessment report is available through the School homepage at  
[http://www.uamont.edu/Math\\_and\\_Sciences/school/assessment.html](http://www.uamont.edu/Math_and_Sciences/school/assessment.html).

**August 14, 2008**

## **I. Learning Outcomes**

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

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

## II. Linkage of Learning Outcomes to the Mission of UAM

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

### **III. Communication of Learning Outcomes to Prospective and Current Students**

The assessment report is available through the School homepage at  
[http://www.uamont.edu/Math\\_and\\_Sciences/school/assessment.html](http://www.uamont.edu/Math_and_Sciences/school/assessment.html).

One section of all School course syllabi is course objectives. These include the learning objectives as they relate to the specific course. Copies of three typical courses syllabi are included in Appendix.

The mission of the School as it appears in the Catalog is:

The mission of the School of Mathematical and Natural Sciences is to offer specialization in biology, chemistry, mathematics, and natural science and to provide opportunities for all students to enhance their understanding of science and mathematics. Curricula offered in the School prepare graduates for careers in industry and teaching, for graduate studies, and for admission to professional programs including allied health, dentistry, medicine, optometry, and pharmacy. This mission is fulfilled through the following goals:

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, physical education, pre-veterinary medicine, psychology, and wildlife management.
5. To serve the General Education program through courses in astronomy, biology, chemistry, earth science, mathematics, physics, and physical science that provide a basic background for a baccalaureate degree.

#### **IV. Evidence of How Students Have Achieved Learning Outcomes Goals.**

Provide specific evidence of how your unit assesses whether students have achieved your unit's student learning outcomes. (Examples: pre/post tests, post tests, capstone courses, surveys, graduate rates, etc.) Address historical patterns or trends.

Biology, chemistry, and mathematics all have capstone courses. These courses are senior seminars or research courses which demand that the student not only demonstrate a knowledge of subject matter but also show that the student is capable of synthesizing this information and applying it to a new situation. The student must then prepare a paper and make an oral presentation which is reviewed by the faculty and their fellow students. Many of these students use their papers as the basis for presentations at state, regional, or national professional meetings.

Graduates planning to attend professional or graduate school must take a national test, MCAT, PCAT, or GRE. This provides information on the subject knowledge of the student compared to that of graduates of other schools. Over the past several years, the students have been required to provide a copy of test scores in order to receive committee recommendations. Some students have not provided scores, and never apply to any of the above programs. It is assumed those students did poorly, but we have no data to see what areas need improvement. Typically, the students that submit scores to us do best in chemistry, with scores in the 70-90 percentile range being common. Some students have scored above the 95<sup>th</sup> percentile in Chemistry. These trends are probably due to the fact that the General Chemistry courses across the nation are all very similar in what is taught, and the test follows that material very closely. It does in fact indicate that our General Chemistry courses are doing a good job preparing students for this exam. One administrator at the UAMS College of Pharmacy says that the scores on the Chemistry section of the test usually indicate the amount of rigor in the General Chemistry sequence. We agree that this may be the case since students that take their General Chemistry at a two-year college before transferring to UAM usually don't perform as well on that section of the exam. The students also do fairly well in the Quantitative section of the PCAT exam with scores typically being in the 55-90 percentile range. On the Biology section of the exam in the past, our students have not done as well; however, the addition of the Principles of Biology sequence has caused an improvement in the scores in this area over the past few years. Before the Principles sequence was implemented, scores typically ran 40-60 percentile in biology, but since the implementation of the Principles sequence, scores are slightly higher, being in the 50-80 percentile range. The Verbal portion of the exam tends to be boom or bust, depending on whether the student is a life-long reader. This portion of the exam is affected least by the amount of preparation put in prior to taking the exam. The number of students taking the MCAT and GRE has been very low. Not enough data is on file to recognize trends on these exams. Some consideration is being given to requiring ALL graduates to take the GRE, or other nationally compared examination.

Several disciplines use a common final examination to evaluate the overall success of a course. Chemistry uses American Chemical Society developed tests in General Chemistry and Organic Chemistry. Mathematics uses a locally developed common examinations for all sections of Introduction to Algebra, Intermediate Algebra, College Algebra, Survey of Mathematics, and Trigonometry. Item analysis of the final exams in the Mathematics courses are reviewed at the end of each semester, and recommendations are made for future semesters.

Student course/faculty evaluations are administered every semester. Following the submission of grades, the results of these evaluations are given to the faculty. To insure student anonymity, all written comments are typed and these are reviewed by the dean and then sent to the faculty. These comments are frequently the most revealing and useful to the instructor. Inherently these comments do not lend themselves to an analytical summary. In addition to the written comments, students complete a 34 question multiple-choice form. Faculty receive a statistical summary of their students' responses. For some questions this is quite adequate but for others the lack of comparable data from other courses limits the instructor's ability to interpret this information. A specific example is question 34, "Overall rating of this course: (1) Excellent, (2) Very Good, (3) Good, (4) Fair, or (5) Poor." Clearly a response of 1 is favorable and of 5 is unfavorable. It is apparent that faculty evaluations by students appear to suffer from inflation. In order to gain a better understanding of what separates good from average, the dean reviews all responses to this question and tabulates the mean result by faculty, discipline, and the entire School. Each instructor receives his/her mean scores by course, all courses, discipline, and School. The following is a compilation of these results over the past nine semesters:

	Fall 03	Fall 04	Fall 05	Fall 06	Fall 07
No.	624	736	763	1017	667
Excellent	257	300	304	454	250
Very Good	194	255	256	347	220
Good	120	125	137	163	135
Fair	39	39	56	41	51
Poor	14	17	10	12	11
Mean	1.97	1.94	1.97	2.56	2.05
High Mean	3.30	3.41	3.07	2.86	3.23
Low Mean	1.50	1.33	1.0	1.0	1.0
	Spring 04	Spring 05	Spring 06	Spring 07	Spring 08
No.	486	606	708	731	unavail
Excellent	210	262	304	320	at
Very Good	140	199	235	234	time
Good	96	108	128	127	of
Fair	24	31	34	39	report
Poor	16	6	7	11	
Mean	2.00	1.88	1.88	1.89	
High Mean	3.4	2.85	2.85	3	
Low Mean	1	1.00	1	1.33	

This year, a comparison was done between question 24, which is overall rating of the instructor to question 34, which is the overall rating of the course. In almost every class, the students perception of the overall rating of the instructor was better than the overall rating for the course.

## V. Measures of Student Performance

Provide evidence of the measures of student performance that your unit collects and analyzes regularly (Examples: retention rates/pass rate for classes, teacher made tests, research papers, recitals, field experiences, etc.). Give specific examples of how analyses of student performance have been used to improve unit decisions.

Each of the multi-section mathematics courses has a course committee. The committee consists of the instructors for the course one of whom is designated as the course coordinator. The committee is in charge of the course. This consists of developing/revising the syllabus, reviewing and revising procedures for the course, exploring alternate delivery systems, developing the tests and final examination, and reviewing results to begin the process again for the next semester. At the end of each semester, the results from the final examinations are carefully reviewed. The concepts in which the students performed poorly are noted. These concepts are given more time and attention the following semester and the instructors discuss different approaches for teaching the concepts. Sometimes concepts are moved from College Algebra to Intermediate Algebra (or Intermediate to Introductory Algebra, etc.) depending on their relevance to the particular course. One example of this occurred in Spring 2006 with graphing linear functions. This concept is very important for Intermediate Algebra and was not receiving due time. Therefore, graphing is now taught in Introductory Algebra and merely reviewed in Intermediate Algebra.

Students in all sections of Introduction to Algebra, Intermediate Algebra, Survey of Mathematics, College Algebra, and Trigonometry all take the same final examination for each course. This does not provide data for comparison to other schools but does provide an internal measure which assists the faculty in modifying the courses to improve student performance. The course committee analyzes the results and then strives to make changes which will improve student performance in the course. Normally these changes are at the "micro" level i.e. they involve small changes of emphasis within the specific course but the changes may impact the entire sequence of courses. This is an on-going process but the most major changes occur during the planning period prior to the start of fall classes. This offers an opportunity for the faculty to reflect upon the interrelationships of these courses. At this point it is not unusual for topics to be shifted from one course to another.

During the Fall 2007 term, 78% of the students that completed the course in College Algebra passed with a grade of D or better. Approximately 30% of those that completed the course in Intermediate Algebra passed with a grade of C or better, while Introductory algebra faired slightly better with 41% of the completers passing with a grade of C or better. A grade of C is needed to progress to the next course for both Intermediate and Introductory Algebra. These pass rates sound extremely low, but when comparing to pass rates of other Arkansas universities at the Arkansas Math Chairs conference, our numbers are very similar to those of other small 4-year institutions across the state. It was noticed that in many summer terms, the success rate is somewhat higher. After discussion, our math faculty came to the conclusion that the everyday format of summer school was advantageous to those needing remediation; therefore, in the Spring 2008 term, fast track courses were done for the first time, in which Intro to Algebra meets daily for the first half the term, and Intermediate Algebra meets the second half of the term. A second course in Introduction to Algebra was also offered in the second half for those that were unsuccessful in the first half of the term. At this point, institutional research has not finished the analysis

of these courses; however initial findings appear to indicate a slightly higher success rate for the students in the fast track courses. Eleven of thirty-eight students (29%) passed the Intro Algebra fast track course in the first half of Spring 2008. Six of those eleven (55%) also passed the fast track Intermediate Algebra course taught in the second half of the semester. Thirteen of the students that were unsuccessful in the Intro Algebra fast track course enrolled in a second Intro Algebra fast track course during the second half of the term. Eight of those thirteen passed with a C or better. Overall 19 of the original 38 enrollees (50 %) in the Intro Algebra completed that course in the Spring 08 term, even though some students did have two attempts during that term. Approximately 16% of the original cohort completed both Intro Algebra and Intermediate Algebra in the single semester. A study of the fast track courses will continue through the Fall 2008 term.

Recently, the common final exam and item analysis was attempted for the Anatomy and Physiology courses. The impetus for this action is an analysis of the grades and content coverage of different sections at different locations. At this time, little or no analysis of final exam grades has been done. This is partly due to the fact that the courses taught at both Crossett and McGehee have been modified to be very similar to those taught on the Monticello campus. Student expectations are now very similar between the campuses, and grade inflation at the branch campuses has decreased. More will be done in the future in this area.

Students completing both General Chemistry and Organic Chemistry are given nationally normed American Chemical Society (ACS) Examinations as final examinations. Scores on these exams indicate that our students are continuing to perform near the national average especially in Organic Chemistry. The item analysis from the final exams are reviewed periodically to identify trends on the most commonly missed questions. The individual faculty member uses this information to improve coverage in certain areas. In recent years, the laboratory exercises have been changed slightly to provide additional coverage for areas that were identified as a problem area on the ACS Final Exam. The Spring 2006 Organic Chem II ACS final examination item analysis was reviewed. Many of the questions missed were at the end of the text in sections that were not covered adequately due to lack of time. In the Fall 2006/Spring 2007 Organic Chemistry I and II sequence, most of the spectroscopy topics were moved to the laboratory segment of the course, which allowed the coverage of three to four more chapters during the two courses. Scores on the Spring 2007 standardized final examinations averaged seven percentage points higher than the previous year, with nine out of the ten students completing the course scoring above national average, based on the schools that had reported scores during the previous years. In the Fall 2007/Spring 2008 Organic Chemistry I and II sequence, slight changes were made to the order of coverage of material. This allowed for some topics to "bundled" for a specific exam, as was the case in Organic Chem II when the order of chapter coverage was changed slightly to allow all coverage of carbonyl compounds to be done at one time, and therefore being tested at one time. It also allowed for some topics that are so similar that sometimes students get confused about to be separated into two different exams. For example SN1 & SN2 reactions were covered on test three of the fall semester, and the E1 and E2 reactions were covered on test four of the fall semester. The similarity of the material often causes confusion among the students. The students still must assimilate the material for the final exam, which is comprehensive, and covers both topics. The Spring 2008 ACS final exam scores were somewhat lower than the previous year, but the class average was still slightly above national average (36 correct answers for UAM students vs. 35 correct answers for the national average). The drop in score for the Spring 2008 class may be due to the fact that a larger percentage of students completed the course, and therefore took the final exam as compared to the Spring 2007 course.

Biology, chemistry, and mathematics all have a capstone course requirement. Respectively these courses are BIOL 4741, Biology Seminar; CHEM 4611, Chemistry Seminar, or CHEM 4691, Senior Research; and MATH 4711, Mathematics Seminar. Students research a topic, synthesizing information from both the library and their own class and laboratory experiences. They then present their findings orally to their peers and the faculty. Students also submit a written paper. The Biology Seminar requirements are constantly being tweaked to improve the course. With much of the information coming from the internet, changes have been made in how the material is properly referenced and judged for validity. In 2008, Chemistry also added a course specifically designed to expose the graduates to specific topics that will be seen in industry and in graduate school, Advanced Techniques. This course also has a seminar component. This course was added because many of the students were not being exposed to specialized techniques on equipment not found at UAM. Also, many of the students were by-passing the seminar by doing senior research and then presenting a poster at a regional meeting.

Upper-level science courses frequently require extensive laboratory reports which demand that the students generate and organize data. They must then synthesize their results to form a reasonable conclusion and present these results in writing and/or verbally. This provides an excellent opportunity for the faculty to observe the students development and, if needed, suggest steps which will address any deficiencies.

Many students from the School of Mathematics and Natural Sciences make presentations at state, regional, or national meetings. Although this is common to the sciences, mathematics students have become more involved over the past few years, especially those planning to enter the teaching profession.

Several biology courses are very oriented to field experiences, a few examples are BIOL 3434, Regional Flora, BIOL 3493, Marine Biology, and BIOL 3524, Ornithology. In addition to learning field procedures and techniques, these trips make the same demands of the student with the additional burden of functioning in a natural environment which displays a level of variability not found in a textbook. As an example, the ornithology field trip provides students with hands on research experience. On this trip students have the opportunity to observe a working field study site in action. Here they are able to observe how ornithologists study and collect data on birds during the annual spring migration. The capture and release techniques used on these study sites also provide a unique opportunity for students to see birds in the hand rather than flying or in a tree. The research aspects along with an outstanding opportunity to identify numerous species that students would normally not see make this trip a highlight of the semester. In 2007-2008, the number and length of field trips was increased. One summer course even involved an extended stay in Costa Rica to study the plants and animals of the Caribbean coastal region.

In the past, the School monitored student performance on the CAAP examination and related this performance to the student's ACT scores and UAM grade point average. This past year, the CAAP exam was dropped by the University, so that comparison no longer exists. In the inception of the program, it was hoped that the CAAP exam would provide a General Education assessment tool, but was very primitive. For instance, the School of Math and Sciences students statistically outperformed those from the rest of campus. So it could be assumed that those students were getting better general education preparation than the remainder of campus; however, ACT scores for the Math and Science students were also far greater than those across campus.

## **VI. Utilization of Information**

Provide specific evidence of how your unit utilizes information, other than student performance, to determine necessary unit decisions. Describe how your unit analyzes and selects a course of action. Attach documentation that supports your determination. (Examples: senior surveys, alumni surveys, professional meetings, minutes from faculty or committee meetings, etc.)

The School attempts to be a “good listener” to the comments of students, graduates, alumni, employers, professional & graduate schools, and the general public. This is done through a variety of means which include interviews, surveys, comments, and conversations. In addition, the School attempts to be introspective and consider ways in which a student’s total experience may be improved. A few specific examples of actions which were the result of these reviews are:

Students preparing for medical school were telling us that the increased amount of physics on the MCAT exam was causing them to score lower in the physical sciences area. Through academic advising, we are encouraging those students to take their physics earlier than they have in the past. We have also revived the University Physics I and II sequence to give those students a more in depth background. The laboratories were changed from two hours to three hours in order to give more hands-on practice.

Many students with an interest in the life sciences have declared themselves to be pre-medical students under the impression that medicine or a related field is the only option for students interested in biology. While the curriculum for the biology major is broad based it is focused toward providing a background for those planning to enter the health sciences. Discussions with students led to the development of a new option in biology, Organismal Biology, which emphasizes field biology. This program addresses the interests and needs of segment of students and should complement the Wildlife Management major offered by the School of Forest Resources. At this time, very few students have chosen the Organismal Biology option; however, there has been much more interest among the biology majors in attending graduate school in a field biology related area. Of the 16 Biology graduates this year, there are several that were/are strongly considering a graduate program instead of an allied health field.

Another change that was brought about recently due to discussions with students was the change in order of course offerings in Biology. In the past, some students took Genetics prior to Cell Biology, while others took the courses in the opposite order. The students complained that there was too much repetition in both courses in order to get the others “up to speed”. The newly planned curriculum now has Genetics offered every Fall term, and is a pre-requisite for Cell Biology. This will allow a more in-depth coverage of material in the Cell Biology course without having to go over the basic material again.

A number of students that are attending an allied health program at Jefferson or UAMS have indicated the need for a medical terminology course. They have indicated that it would greatly help on the entrance examinations for these programs and also will help in the specific course work after accepted into the program. Discussions among our faculty and the also the Division of Nursing are currently taking place to look at the possibility of adding this course for those students.

## **VII. Future courses of action**

Based on your answers to Questions V and VI regarding student learning outcomes, prioritize your unit's future course of action. Include plans for what will be done, by whom, to what extent, and how often.

The Principles of Biology course sequence is new and will be reviewed and revised as needed. While several questions exist the course appears to be serving its purpose. The faculty is examining student success rates. A specific concern is the current prerequisite of a minimum composite ACT score of 20. This may need to be increased.

Currently Anatomy and Physiology I and II are offered at all three campuses of UAM. The content and quality of some sections has been unsatisfactory. During the past year all instructors were to submit syllabi and tests to the course coordinator. This was not always the case. During the next year more vigorous efforts will be taken to ensure that all campuses offer essentially the same course and that this course meets the needs of students planning to enter the B.S.N. program.

The School of Math and Sciences faculty are currently reviewing the recommended course scheduling order for each major. Changes will be made in pre-requisites and co-requisites to minimize repetition of material and to provide a better prepared student for the more rigorous courses.

Alternatives to the normal scheduling of courses will be attempted and evaluated, as related to student success rate.

Student evaluations of faculty and courses will continue to be carefully reviewed and monitored. At times individual instructors may be advised to change their behavior or instructional techniques based upon these responses. The results for the entire School as measured by the responses to question 34 also serve as an indicator of student satisfaction. The review of the evaluations will also include question 24 in the future to give the instructors a more specific idea of their performance, separate from the overall course satisfaction.

With the increase in technology available to us, many of the faculty will use more technology in their lectures and labs. Several faculty have indicated they will use the "smart room" technology in order to better hold the student's attention in class. This may affect success rates in some of the remedial mathematics courses.

**VIII. Specifically describe how your unit is making student learning accessible, including, if applicable, alternative modes of instruction (CIV, WebCT, weekend, Early College High School, etc). Address historical patterns and trends.**

For many years the School has regularly offered mathematics courses at Crossett and McGehee, and occasionally at Warren. At one point, these courses were offered on-site but frequently the demand for the courses was insufficient. With the advent of CIV we were able to have one instructor simultaneously offer a course at Monticello, Crossett, and McGehee. Combing the three locations meant that there is sufficient enrollment to offer the course. While this is far more efficient, the CIV medium leaves much to be desired in teaching students mathematics especially at the developmental level. With the merger of the Crossett and McGehee schools into UAM, there is increased demand for these courses. So much that these locations may be able to justify hiring instructors to teach the course on-site. Both of these campuses have hired additional instructors and have moved away from the CIV instruction as much as possible.

While we have encountered difficulties with CIV instruction in mathematics there are even greater problems with CIV science instruction. The lecture portion of the course can be done relatively well and we have offered several science lecture classes through CIV. The main problem with CIV science lecture courses has been the inability to allow students to observe and participate in demonstrations. A significant problem is with science laboratories. The remote locations lack adequate laboratory facilities and equipment. In addition, the nature of the laboratory demands on-site supervision for instructional and safety reasons.

We currently offer one science course on-line. This is an Earth Science course, ESCI 1123/1131, Meteorology. The course includes a laboratory and is designed for the General Education student. This course has been very popular during the 2007-2008 academic year. In the future we may be able to develop similar courses in the other sciences but this is not a priority within the School. It is perceived that academic honesty is a problem among the students taking totally on-line courses. In an attempt to alleviate this problem, the Meteorology course has become a hybrid course, with exams being done on-site. This apparently has not hurt enrollment in this course. Other course offerings are being considered, such as Oceanography. The possibility of an increased offering of courses of this type has even encouraged one of our lab instructors to pursue a Master of Science degree in physical science through Mississippi State University.

Since the 2005-2006 academic year, a significant number of mathematics courses were offered through the Early College High School. The number of students enrolling in these courses continues to increase and the monitoring of the quality and content of these courses has become a significant problem. On-site evaluations, personnel changes, and close contact with the instructors seems to have minimized problems in mathematics. These courses are offered face-to-face at Hamburg High School and by CIV through the Co-op to many schools throughout the state. The students taking these courses are typically the high schools best students which have met the ACT requirements for the specific math course. The Hamburg High School instructor works very closely with the UAM faculty, and in Fall 2007 her students outperformed every other section of College Algebra on the unified final, including all sections taught on campus by UAM faculty. She attributes the success to having a very selected group of students, and also that they have about 50% more instructional time than those students taking the course on campus. Some of the math faculty have indicated that they feel that they are getting fewer excellent students in the College Algebra course than in the past. This may be due to the fact that there is an increasing number of excellent students that have already completed College Algebra before entering UAM as a full-time student.

**IX. Specifically describe how your unit involves students directly in the assessment process.**

In addition to the summary of student responses on the student evaluation form, all student comments from the student evaluations are typed, reviewed by the School Dean, and discussed with the faculty.

The School surveys all graduating Math/Sci. students on their experiences at UAM. This is an open-ended survey essentially asking students to list what they liked and disliked about UAM. The results are fairly predictable. Many students have general complaints such as inadequate parking, lack of extracurricular activities, local laws on alcohol consumption, etc. The comments of direct interest to the School are praise or criticism of specific instructors, appreciation of small class size and the attention given them by particular faculty, and willingness of faculty to help them. The most frequent criticism is the infrequency with we offer some upper-level courses, particularly in mathematics and chemistry courses.

The School also periodically surveys graduates in a manner similar to the exit interviews of graduating students. The results are quite similar. The graduates are less harsh in the occasional criticisms of particular faculty and are even more enthusiastic in their praise of the general and specific efforts of the faculty. This is especially true of the students who have entered graduate and professional programs. They were happy with the small class sizes but again are critical of the scheduling of upper level courses.

Students are active in several School organizations, such as Sigma Zeta, the Pre-Med Club, and the Biology Club. Even though there is mainly social contact between the faculty and the students in these organizations, this does allow the students to have informal discussions with faculty members on a variety of topics, including program issues. The students in the Pre-Med Club and Biology Club specifically make decisions on which schools are visited and to what locations the summer field courses are taken, respectively.

**X. Describe and provide evidence of the efforts your unit is making to retain students in your unit and/or at the University**

The faculty of the School of Math and Sciences have put more emphasis on advising students into courses based on skill level, as opposed to what are required for their degree. We feel this helps retention because it eliminates the early failures which discourage students and cause them to drop out. There are numerous examples, but here are two specific examples:

Nursing students are not required to take any course in biology before taking Anatomy and Physiology I and II, both of which are sophomore level courses. The faculty are reviewing ACT scores of essentially every student enrolled in those courses and encouraging them, especially those with low ACT scores to take a freshmen level biology course prior to Anatomy and Physiology.

Agriculture students are required to take General Chemistry I and II. Many of these students come to UAM with no prior chemistry, or a very poor high school chemistry experience. We are strongly encouraging those students to take Introduction to Chemistry prior to General Chemistry. We have seen that the success rates of these students is far better in the General Chemistry courses after taking Intro Chemistry.

Letters and calls have been sent to several students that have completed a significant portion of their degree and then dropped out. Calls were made from my cell phone, so don't have a log as evidence. See Appendix for a copy of a letter sent to a student.

The faculty of the School of Mathematics and Natural Sciences are encouraging our majors to be connected to the University outside the classroom:

The Biology/Pre-Med Clubs are now tailgating prior to every home football game.

We have a newly formed Math-Physics Club and are encouraging students to get involved with their activities.

The School and its faculty are making efforts to help the students financially:

By supplying positions and encouraging our students to obtain work-study jobs on campus in order to have a stronger tie to the University.

By writing grants to provide opportunities for our students to be involved in research.

By considering more freshmen and sophomore students for departmental scholarships and also taking need into consideration rather than just past academic performance.

Several faculty are now using their first day of freshmen level classes as “orientation day”:

By giving tips on taking notes, studying for exams, test taking tips,

By assigning some sort of a group activity to allow students to network

By very specifically letting them know the faculty members expectations.

We are trying to modernize the way we teach use different instructional strategies by using appropriate technology. Some of the technology age students tend to relate better to teachers using modern technology. Other courses are greatly enhanced by downloaded supplemental material such as pictures of organisms, or sound clips of birdcalls, etc..

We have the classrooms in the B-Wing of the Science Center and the Auditorium set up as smart rooms with computers, digital projectors with sound capabilities, and document cameras.

We have purchased Interwrite® tablets for use by some of the mathematics faculty, which not only allows for a cleaner presentation of the material but also allows easier dissemination of lecture materials prior to class through e-mail or website access.

The Physics lab has set up a computer network that allows computerized data collection, and analysis that is far more accurate than any hand measured data.

New planetarium equipment was purchased through a NASA/Arkansas Space Grant Consortium. This will greatly enhance the Astronomy and Physical Science courses.

## **Appendices**

- I. Graduate Survey
- II. A representative Chemistry syllabus
- III. A representative Biology syllabus
- IV. A representative Math syllabus
- V. Retention letter

Mathematical and Natural Sciences Graduate Survey

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

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

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

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

What changes do you recommend?

Is there anything else you would like to add?

---

The following information is optional:

Name: \_\_\_\_\_

Major(s): \_\_\_\_\_

Minor(s): \_\_\_\_\_

E-mail address: \_\_\_\_\_

What are your plans after graduation?

Please drop off your survey to the Math/Science Office in the Science Center or mail to:  
Graduate Survey  
School of Mathematical and Natural Sciences  
P.O. Box 3480  
Monticello, AR 71656-3480

Feel free to drop in for a visit. There's usually coffee available. Student organizations have tailgating at football games, etc...  
You are always welcome to join in. The newsletter is produced periodically. (Usually early Fall)  
If you don't receive an annual newsletter by mail or electronically, please contact the Math/Science office at 870-460-1016.

# School of Mathematics and Sciences

Fall 2007

## CHEM 1103

## GENERAL CHEMISTRY I

Note: This course is the first part of a two semester course surveying the basic principles and concepts in chemistry

Text: *General Chemistry: The Essential Concepts*, 5th Ed. by Chang

Prerequisites/Co-requisites: ENG 1013 (Comp I), MATH 0065 (Int. Alg), or equivalent are co-requisites for this course. See the current academic catalog for more information.

**INSTRUCTOR:** Morris Bramlett, A-7, 460-1116, bramlett@uamont.edu

Office Hours: M-F 9:00 – 10:00, or by appointment

### COURSE:

Format: Three hours of lecture per week.

- Goals:
- a. to provide the student with a general overview of the fundamental concepts of science.
  - b. to provide each student with details of laws and theories applicable to chemistry.
  - c. to provide practical laboratory experiences to reinforce the natural laws and theories of chemistry.
  - d. to provide each student with general properties of elements and compounds including uses, hazards, and proper handling techniques.
  - e. to enhance the scientific approach to reasoning and problem solving.

Course Content: Topics to be covered in lecture are:

- 1. Introduction
- 2. Atoms, Molecules, and Ions
- 3. Stoichiometry
- 4. Reactions in Aqueous Solution
- 5. Gases
- 6. Energy Relationships in Chemical Reactions
- 7. The Electronic Structure of Atoms
- 8. Periodic Relationships among the Elements
- 9. Chemical Bonding I: The Covalent Bond
- 10. Chemical Bonding II: Molecular Geometry and Hybridization of Atomic Orbitals if time permit.

### GRADING:

Four 1 hour exams and a comprehensive final exam will be given. All four exams and final will count 100 points each. The lowest of the four 1 hour exams will be dropped and replaced with the percentage scored on the final exam, if the score on the final exam is higher. Quizzes will be given regularly, sometimes unannounced. The combined quizzes will be worth 100 pts, (equivalent to 1 exam). The best 7 quiz scores will be used to calculate the quiz average. Homework assignments will be taken up and graded occasionally, and will be worth a total of 50 pts for the semester. No make-ups will be given for quizzes or exams. Any missed quiz or test will count as your drop score. Only one exam score may be dropped and replaced with the final exam. The final exam cannot be dropped.

Grade Scale
88 - 100% = A
77 - 87% = B
66 - 76% = C
55 - 65% = D
< 55% = F

**ATTENDANCE:** Regular attendance is required. Roll will be taken daily, and irregular attendance may be reported to the university administration for possible action involving financial aid. Absence of 6 hours of lecture may result in your being dropped from the class with a W or with a failing grade. You are responsible for learning all material covered in class.

**READING AND REFERENCE MATERIAL:** Additional copied material will be distributed in class. Materials for further reading are available in the library or from my office. Student Solutions Manual, and Student Study Guide are available in the bookstore, however purchase of these supplements are optional.

**ACADEMIC HONESTY:** Cheating, helping others cheat, disruptive behavior, or other improper conduct will not be tolerated, and could lead to dismissal from the course with a failing grade.

The use of graphing and programmable calculators are permitted, however, if your calculator contains information that you do not want erased, (even from another class) you should bring a different calculator on test days.

### **SOME IMPORTANT DATES TO REMEMBER:**

Wednesday Aug 22.....First day of Class  
Tuesday Aug 28.....Last day to add classes  
Monday Sep 3.....Labor day holiday  
Monday Nov5..... Preregistration begins  
Wednesday Nov 7..... Last day to withdraw with a W  
Wednesday-Friday Nov 22 – 24.....Thanksgiving Holiday  
Tuesday Dec 4..... Last day to withdraw with a W if passing  
Friday Dec 7.....Last day of Class  
**FINAL EXAM Tuesday, Dec 11, 10:30 - 12:30**

### **STUDENTS WITH DISABILITIES**

It is the policy of the University of Arkansas-Monticello to accommodate individuals with disabilities pursuant to federal law and the University's commitment to equal educational opportunities. It is the responsibility of the student to inform the instructor of any necessary accommodations at the beginning of the course. Any student requiring accommodations should contact the Office of Special Student Services located in Harris Hall, 1st floor, phone 870-460-1026; TDD 870-460-1626; fax 870-460-1926.

### **FREQUENTLY ASKED QUESTIONS**

Do I need to buy the book for this class? YES

Do I need to buy the supplemental materials and guides provided by the publisher? NOT REQUIRED

Do you curve grades? NO, BUT ANY GRADE SUCH AS 79.5 WILL ROUND UP TO AN 80

Do you take roll? YES, IT IS REQUIRED BY THE UNIVERSITY

If I miss an exam can I make it up? NO, IT WILL COUNT AS YOUR DROP EXAM

If I have two exams on the same day, can I take yours early or late? NO

Can I drop the final exam? NO

Does the lab affect my grade in this course? NO, IT IS A SEPARATE COURSE WITH A SEPARATE GRADE

Recommended Homework Problems:

Chap 1: 1-40 all, 41, 42, 44, 45, 47-50 all, 55, 56, 57, 59-63 all, 70, 71

Chap 2: 1-57 all, 59-70 all, 72, 73, 74

Chap 3: 1-10 all, 13-33 all, 35-72 all, 74-83 all, 85, 87-92 all, 94, 99, 104, 105, 106

Chap 4: 1-20 all, 23-32 all, 35-66 all, 69, 70, 74-89 all, 91, 92, 93, 94, 98, 100, 103, 105, 107, 108, 110, 111, 112

Chap 5: 1-52 all, 55-90 all, 92-95 all, 102-104 all, 107, 108

Chap 6: 1-79 all, 82-92 all, 94, 95, 98, 101

Chap 7: 1-96 all, 98, 99

Chap 8: 1-76 all, 79-88 all, 90, 92-96 all, 99

Chap 9: 1-77 all, 81-92 all, 94-100 all, 102, 103, 104, 106-110 all

Chap 10: 1-53 all, 55-60 all, 63, 65, 70-72 all

**Biology 1083—Principles of Biology II**  
**Department of Mathematical and Natural Sciences**  
**Spring 2008, MWF, 11:10-12:00**  
**Science Center B-18**

**Instructor:** Dr. John L. Hunt. Office: B-11, Science Center. Phone: 870-460-1466  
E-mail: [huntj@uamont.edu](mailto:huntj@uamont.edu). Web page: <http://www.uamont.edu/facultyweb/Huntj>.  
Office Hours: MWF, 9:00-10:00; TTh, 10:00-11:00, or by appointment.

**Prequisites:** BIOL 1053 and BIOL 1041, each with a grade of C or above.

**Required text:** Campbell, N. A., and J. B. Reece. 2005. *Biology*. Seventh Edition. Pearson-Benjamin Cummings, San Francisco, 1231+ pp. Available at UAM bookstore (\$120.00 used, \$160.00). The eighth edition is also acceptable.

The associated website is at: [www.campbellbiology.com](http://www.campbellbiology.com) (registration required).

**Course Objectives:** To acquaint the student with the basic concepts of biology, with emphasis on evolution, diversity, and ecology of organisms. This course will strive to convey knowledge of basic biological concepts and to stimulate an interest and understanding of the natural environment.

**Class web page.** The class web page may be found at:  
[www.uamont.edu/facultyweb/Huntj/Principles.htm](http://www.uamont.edu/facultyweb/Huntj/Principles.htm). On this page there are lists of terms to know and lecture outlines for each of the chapters of the text we will cover. These outlines are general in nature, and are not meant to replace detailed notes which you should take in class. Test scores will be posted on the class web page shortly after each exam. Your score will be listed by an anonymous code word selected by you.

**Tests and grading:** Grades will be computed as a percentage of 450 points. Of these, 300 points will come from 3 hourly exams, 100 will come from the final exam, and 50 will come from unannounced quizzes. Grading will be on the standard 10-point scale (90-100 = A, 80-89 = B, 70-79 = C, 60-69 = D, 0-59 = F). There is no curving of the grade or "extra" credit. No test scores will be dropped. Points will be earned from scheduled examinations and from unannounced quizzes.

Tests will consist of a mixture of objective and subjective questions, and will be on the dates listed below. These dates *will not* change. Exams may include bonus questions on material from the text that has never been discussed in class. The final exam will be Friday, May 2, at 1:30 p.m. The final will be 25% comprehensive; other exams are not comprehensive.

The number of quizzes is approximate. There will be an average of 1 quiz per week at the beginning of one of the lecture periods. There will be at least 10 quizzes during the semester; if there are more, students will be allowed to drop the lowest scores and count only their 10 best quizzes. These quizzes will be unannounced and will consist of one to five questions from the previous day's lecture. Quizzes are designed to

encourage daily review and study, and regular attendance and promptness, and therefore, MAY NOT be made up.

**Attendance:** Attendance at all lectures and exams is mandatory. Attendance will be taken on a daily basis. Any student who misses more than six class periods may be dropped from the class without warning. Quizzes may not be made up. However, missed quizzes will not count against the grade of any student who presents the instructor with an approved excuse for his absence. Approved excuses do not include "hung over," "overslept," "had a flat," "worked an extra shift," or "abducted by aliens." Students with approved excuses may make up missed exams, by arrangement with the instructor. Please be aware that make-up exams will NOT be the same exam given during the normal class period. It is important for you to note that you are responsible for material covered in every class, even if you miss the class with an excused absence. It is your responsibility to obtain the material you have missed; the instructor will NOT provide notes for missed classes. Most exam material will come from lectures, so that your success, or lack thereof, in this class is directly related to attendance.

**Class policies.** The points in this class are not concentrated near the end—you need to do well early in the semester. The instructor is here to help you. Please feel free to ask questions at any time. You are encouraged to seek help outside of regular class hours if you are so inclined, either during office hours or by appointment. Tutor service is available at Harris Hall—call 870-460-1054 for details.

Please do not hold conversations with classmates during lecture. You may tape lectures if you so desire, but this should not substitute for the taking of detailed class notes. **DO NOT BRING CELL PHONES TO CLASS!** If your cell phone rings during my lecture, I will respond in the only manner available to me—by adjusting your grade. You may not text-message or keep your cell phone on your desk during class. No electronic devices other than tape recorders are allowed in class—this includes laptops and i-pods. Disorderly conduct is any behavior which disrupts the regular or normal functions of the University Community, including behavior which breaches the peace or violates the rights of others. This type of conduct is prohibited by the Student Conduct Code. The Code may be found on pages 35-38 of the 2007-2009 UAM Catalog.

**Academic dishonesty:** Cheating will not be tolerated. The Academic Code of the University of Arkansas-Monticello may be found on pages 35-36 of the 2007-2009 UAM Catalog. Please note that the instructor has wide latitude in taking corrective action in response to cheating; expect the harshest possible response in this class. You will not be allowed to have a cell phone of any sort on your desk during exams (or any other time during class).

**Students with disabilities:** It is the policy of the University of Arkansas—Monticello to accommodate individuals with disabilities pursuant to federal law and the commitment of the University to equal educational opportunities. It is the responsibility of the student to inform the instructor of any necessary accommodations at the beginning of the course. Any student requiring accommodations should contact the Office of

Special Student Services located in Harris Hall, Room 120, phone 870-460-1026, TDD 870-460-1626, fax 870-460-1926.

**Subjects to be covered (with associated text chapters):** Chapter 49 (pp. 1063-1074)—skeleton and muscles; Chapter 12—the cell cycle; Chapter 13—meiosis and sexual life cycles; Chapter 14—Mendel and the gene idea; Chapter 15—chromosomal basis of inheritance; Chapter 16—molecular basis of inheritance; Chapter 17—from gene to protein; Chapter 22—Darwinian view of life; Chapter 23—evolution of populations; Chapter 24—origin of species; Chapter 25—phylogeny and systematics; Chapter 26—biological diversity; Chapter 27—prokaryotes; Chapter 28—protists; Chapter 29—evolution of land plants; Chapter 30—seed plants; Chapter 31—fungi; Chapter 32—animal diversity; Chapter 33—invertebrates; Chapter 34—vertebrates; Chapter 50—ecology and the biosphere; Chapter 51—behavioral ecology; Chapter 52—population ecology; Chapter 53—community ecology; Chapter 54—ecosystems; Chapter 55—conservation biology.

**Important dates:**

January 21	Martin Luther King Holiday—no class.
February 8	Exam I.
February 27	Exam II.
March 17-21	SPRING BREAK (Woo-hoo!)
March 28	Exam III.
April 2	Last day to drop.
April 11	No class.
April 28	Last day of class.
May 2	Final Exam, 1:30 p.m. 25% comprehensive.

**School Of Mathematical & Natural Sciences Course Syllabus**  
**MATH 1073: COMPACT CALCULUS, SPRING, 2008**

**INSTRUCTOR**  
Dr. Carole Efird  
Phone: 460-1464

**OFFICE**  
Science Center A-29  
**OFFICE HOURS**  
MWF 9 - 10, 11 - 12, 2 - 4  
**E-MAIL:** [efird@uamont.edu](mailto:efird@uamont.edu)      TTH 2 - 4

**NOTE :** This course cannot be counted as credit toward a mathematics major or minor.

**REQUIRED TEXT & MATERIAL:** *Calculus for Business, Economics, and the Social and Life Sciences, 9<sup>th</sup> edition, by: Hoffman and Bradley.* All students are allowed to have access to a graphing calculator. Strongly recommended models are TI-83 or TI-83 plus. Other brands are acceptable but faculty and tutors may not be able to assist students on these machines.

**COURSE PREREQUISITES:** MATH 1033, Trigonometry, and MATH 1043, College Algebra.

**COURSE OBJECTIVES:** This course is intended for students who are neither a mathematics major or minor but require a rudimentary knowledge of calculus and its applications for their respective courses of study. After a brief overview of some algebra, the basic concepts of calculus are studied with emphasis on application.

**COURSE CONTENT & EXAMINATIONS:** The dates are tentative and will be revised as necessary.

Test #	Topic	Date
1	Sections: 1.1, 1.2, 1.5, 1.6	Wednesday: January 23
2	Sections: 2.1- 2.3	Monday: February 4
3	Sections: 2.4 - 2.6	Friday: February 15
4	Sections: 3.1 - 3.5	Monday: March 3
5	Sections: 4.1- 4.3	Friday: March 14
6	Sections 5.1 - 5.4	Monday: April 7
7	Sections 5.5, 6.1, 6.3, 7.1, 7.2	Friday, April 25
Final	Comprehensive	1:30 PM, Wednesday, May 2

**HOMEWORK & QUIZZES:** Homework will be collected sporadically and quizzes will be unannounced. Hence diligent completion of all assigned problems and regular attendance is essential to success in this course.

**GRADING:** The final grade for the course is based on the following percentages:

Quizzes	Tests	Final Exam
10%	70%	20%

The final grades are assigned on the following basis:

A; 90 - 100%    B; 80 - 89%    C; 70 - 79%    D; 60 - 69%    F; 0 - 59%

## SPECIAL POLICIES & SOURCES FOR HELP:

1. If no tests are missed, your score on the final exam will replace your lowest test grade, if the score on the final is higher. If one test is missed, then the grade on the final examination will be substituted for the test grade. If 2 or more tests are missed, a grade of zero will be given for the second and any subsequent missed tests. **Note that the total quiz grade will not be substituted.** There are **NO MAKEUP QUIZ OR TESTS!**
2. Cheating and plagiarisms are unacceptable activities and a grade of zero will be given for any case of verified cheating. All occurrences will be reported to the Vice Chancellor for Academic Affairs for other possible actions. Disorderly Conduct: Any behavior which disrupts the regular or normal functions of the University community, including behavior which breaches the peace or violates the rights of others is prohibited under the Student Conduct Code. In particular, **all cell-phones must be off for the entirety of class period.**
3. You are expected to attend all class meetings and make a serious effort to do the assigned work. After **6** absences you may be removed from the course possibly with a failing grade. If the student wishes to withdraw from the class then he/she should file the necessary papers with the registrar's office. Irregular attendance is the greatest factor in unsuccessful performance in this course, and college at large. You cannot possibly learn the material if you do not go to class.
4. There are a number of resources that you can use to help you be successful in this course. First and foremost, you should see your instructor when you need help. You should consider forming study groups or a homework hotline with some of your classmates. As a long-term commitment, you should consider using the student tutors. There will be free tutoring available to all students in the **Tutoring Lab; Harris Hall, Room 329**. The schedule for the times when tutors will be available will be announced in class and posted throughout the Science Center. Try to take advantage of these sessions.

**EXPECTATIONS OF THE STUDENT:** While this course is not particularly difficult for those who make a commitment to working on the course it does require a commitment of time and energy. The pace of the course is fairly rapid and it is necessary for you to attend class and seriously attack the homework, review recent lectures, and preview material to be discussed at the next lecture. You should commit at least two hours of study time for each hour of lecture and you should focus on understanding the basic principles presented rather than simply mimicking procedures.

## IMPORTANT DATES:

January 9	First day of classes
January 15	Last day to register of add classes
January 21	Martin Luther King Holiday
February 22	Deadline to apply for August and December graduation
March 17 - 21	Spring Break
April 2	Last day to drop with a W
April 7 - 18	Preregistration for Summer and Fall 2008
April 24	Last day to withdraw from class
April 29	Last day of classes
April 30	Final exam, 1:30 - 3:30
May 9	Commencement

## STUDENTS WITH DISABILITIES:

It is the policy of the University of Arkansas at Monticello to accommodate individuals with disabilities pursuant to federal law and the University's commitment to equal educational opportunities. It is the responsibility of the student to inform the instructor of any necessary accommodations at the beginning of the course. Any student requiring accommodations should contact the Office of Special Student Services located in Harris Hall Room 120; phone (870) 460-1026; TDD (870) 460-1626; fax (870) 460-1926.

McGehee: Office of Special Student Services representative on campus; phone (870)222-5360; fax (870)222-1105. Crossett: Office of Special Student Services representative on campus; phone (870)364-6414; fax (870)364-5707.

UAM will no longer mail grade reports to all students. You may access your grades through Campus Connect on the UAM homepage, <http://www.uamont.edu>. To have your grades mailed to you, complete the grade request form available in the Registrar's Office in Monticello or the Student Services offices in Crossett and McGehee.

June 25, 2008

XXX XXXXXXXX

XXX Walnut

Crossett, AR 71635

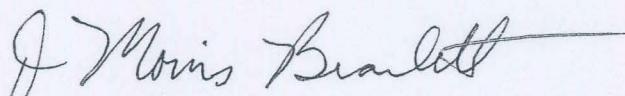
XXX,

I'm taking a chance that you still receive mail at this address. It has been more than a year since I have talked with you. I hope this letter finds you doing well.

I am writing this letter to encourage you to finish your degree. You are extremely close to finishing, and I would like to see you complete the degree. Of course, you can take courses on our campus, possibly on-line courses from our campus, or even courses at another university and transfer them back to UAM. If you are interested, contact me by telephone at 870-460-1116 or by e-mail at [bramlett@uamont.edu](mailto:bramlett@uamont.edu). We will take a look at all options. You may continue in Biology, or opt for the Natural Science degree. Either will provide you additional opportunities in the future. I hope that you will strongly consider completing your degree requirements.

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

Take care,



J. Morris Bramlett, Ph.D.

Dean, School of Mathematical and Natural Sciences