Annual Assessment Report

2006-2007

School of Mathematical and Natural Sciences

August 1, 2007

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 writing and orally;

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

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/annualreports.htm.

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 the supporting material.

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.

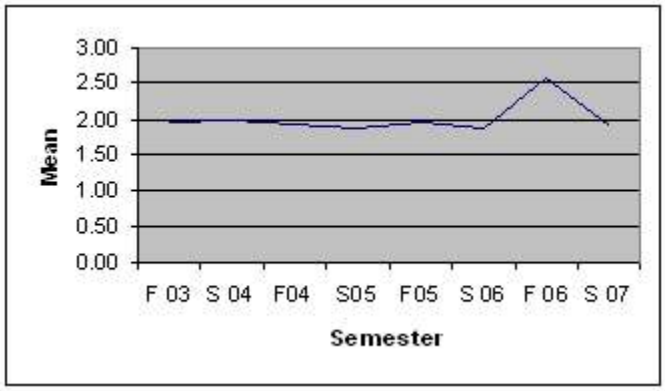
Graduates planning to attend professional or graduate school must take a national test, MCAT, PCAT, or GRE. This provides information on the subject knowledge of the student compared to that of graduates of other schools.

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.

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 the 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, but is a 3 good? To address this 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 eight semesters:

	Fall 03	Fall 04	Fall 05	Fall 06
No.	624	736	763	1017
Excellent	257	300	304	454
Very Good	194	255	256	347
Good	120	125	137	163
Fair	39	39	56	41
Poor	14	17	10	12
Mean	1.97	1.94	1.97	2.56
High Mean	3.30	3.41	3.07	2.86
Low Mean	1.50	1.33	1	1

	Spring 04	Spring 05	Spring 06	Spring 07
No.	486	606	708	731
Excellent	210	262	304	320
Very Good	140	199	235	234
Good	96	108	128	127
Fair	24	31	34	39
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



With the exception of the Fall 2006 semester the results are very consistent with the mean hovering at 2 - Very Good. (As a result we may conclude that a Good score is not very good.)

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.

As of the fall 2006 semester, we will use a similar approach for the Anatomy and Physiology I & II courses. The impetus for this action is an analysis of the grades and content coverage of different sections at different locations.

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.

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.

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.

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 addition to the above, the School monitors student performance on the CAAP examination and relates this performance to the student's ACT scores and UAM grade point average and relates these to the local and national means. The following table is a summary of this performance since 1999.

	CAAP Scores							ACT Scores				
Year	Writ. Skills	Math	Reading	Sci Reas	Essay 1	Essay 2		Eng	Math	Read	Sci R	Comp
1999	64.25	59.25	64.00	60.75	3.94	3.94		21.43	18.29	21.71	22.00	21.00
2000	65.20	60.20	63.67	62.27	2.80	3.03		23.80	21.80	25.00	22.47	23.47
2001	NA											
2002	65.50	60.10	64.10	63.40	3.40	3.10		24.30	23.30	24.00	22.90	23.80
2003	65.91	61.18	63.27	62.91	2.82	2.89		22.18	21.09	24.40	24.20	24.20
2004	64.18	58.82	61.71	61.18	3.06	2.88		23.08	22.15	24.38	22.23	23.00
2005	64.81	60.14	62.89	62.68	3.00	2.95		24.65	22.44	23.53	22.82	23.50
2006	60.75	60.5	59.75	61.75	3.18	3.13		26.5	26	23.5	23.5	25
M&S Mean 1999-2006	64.37	60.03	62.77	62.13	3.17	3.13		23.7	22.15	23.79	22.87	23.42
Local Mean 2006	63.5	57.4	60.4	59.9	‘*	‘*		18.8	18.5	‘*	19.1	19.9
National Mean 2006	64.3	58.0	62.4	61.2	‘*	‘*		21.6	21.6	‘*	21.7	21.1

* No data

The 2006-2007 academic year is the last to require the CAAP examination. While it purports to measure the quality of the General Education program, it is a rather primitive tool in doing so. It is an indicator of general performance and accomplishment. Math/Sci. students significantly outperformed the average UAM student in all areas and had better scores than the national means in all areas other than the two essays. This is an indicator of superior performance and/or ability of these students. It should be noted that these students have ACT scores which are significantly better than those of the average entering UAM student and than those of the average entering college student nationwide.

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, readings, 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:

> Many biology students, especially those planning to attend medical school, need a course in biochemistry. Previously, this has been a four credit hour course consisting of three hours of lecture and three hours of laboratory. Many of these students have been unable to schedule the course due to conflicts between the biochemistry laboratory and other required laboratories. After some investigation, it was found that the laboratory is not necessary for those planning to attend medical school. The existing course was split into two courses, lecture and laboratory, with the laboratory not being required for the lecture students and not being required of those who take the second course in biochemistry. The new format will allow additional students to enroll in biochemistry which will meet their needs without diminishing the quality of their academic background. Chemistry majors planning to attend graduate school will be strongly encouraged to enroll in both the lecture and laboratory courses.
>
> 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

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.

Since a portion of the chemistry graduates entering a Ph.D. program upon completion of their degree expressed that they felt weak in some of the more specialized techniques compared to entering graduate students from larger universities, a new course has been planned. Advanced Lab Techniques (CHEM 4742) is to be offered for the first time during the Spring 08 term, and will cover a broad range of the techniques that are not covered in the other courses. This course will be taught on an annual basis and may possibly be team taught with all faculty members teaching a small portion of the course. This addition was based on needs specifically mentioned by recent chemistry graduates that had entered Ph.D. programs around the nation.

As mentioned above, student evaluations of faculty and courses are 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.

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.

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. In the future we may be able to develop similar courses in the other sciences but this is not a priority within the School. Two faculty members are in the process of developing a similar on-line course in Oceanography.

During 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.

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. This provides an avenue for them to become involved in School developments and revisions.

Appendices

I. Graduate Survey

II. A representative Chemistry syllabus

III. A representative Biology syllabus

IV. A representative Math syllabus

Appendix I

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.

Appendix II

School of Mathematical and Natural Sciences **Spring 2006**
CHEM 3414 **ORGANIC CHEM II** **164101**

Course Description: Organic Chemistry II is the second part of a two-semester course surveying the basic concepts of organic chemistry, including structure, nomenclature, reactions, mechanisms, spectroscopy, and synthesis.

Prerequisites: CHEM 3404 with lab (Organic I and lab)

Texts: Organic Chemistry, 1st Edition, by Janice Gorzynski Smith
Organic Chemistry Experiments for Chem 3404 & 3414 by R. M. McConnell

Instructor: Dr. Morris Bramlett, SC C-9, 460-1465 Bramlett@uamont.edu, Fax 460-1316
web: http://www.uamont.edu/facultyweb/bramlett/

Office Hours: 9:00 - 10:00 MWF; 10:00 - 11:00 TTh; Most afternoons after 1:30 except Wed. & Thur (lab days)

Course Goals:
1) To provide the student with an overview of the physical and chemical properties of carbon compounds and their derivatives.
2) To relate reactions and reaction mechanisms to the structural and stereochemical aspects of carbon compounds.
3) To provide laboratory experiences which demonstrate the basic concepts of organic chemistry.
4) To teach safe techniques for handling organic compounds.
5) To demonstrate to the student how individual reactions are integrated into a planned synthesis.

Course Content:

1) Alkynes
2) Oxidation and Reduction
3) Radical Reactions
4) Conjugation, Resonance, and Dienes
5) Benzene and Aromatic Compounds
6) Electrophilic Aromatic Substitution
7) Carboxylic Acids and Acidity
8) Introduction to Carbonyl Chemistry
9) Aldehydes and Ketones-Nucleophilic Addition
10) Carboxylic Acids and Derivitives
11) Carbonyl Reactions at the Alpha Carbon
12) Carbonyl Condensation Reactions
13) Amines
14) Lipids
15)Carbohydrates
16) Amino Acids and Proteins
17) # Mass Spectroscopy and Infrared Spectroscopy

To be covered in lab

Grading Procedures:

4 Exams @ 100 pts each*	400 points
Best 7 Quizzes averaged	100 points
Homework	50 points
Final Exam	100 points
**Lab	150 points

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800 points possible

*The lowest exam score will be replaced by the final exam score if higher
No make-up exams or quizzes will be given. A missed exam counts as the low exam replaced by the final exam. Only one exam score can be replaced.
** See lab syllabus for point distribution in the lab portion of this course.

Grading Scale:

88 - 100 %	= A
77 - 87 %	= B
66 - 76 %	= C
55 - 65 %	= D
0 - 54 %	= F

Course Policies:

Regular attendance is expected. Attendance will be turned in to the Financial Aid Office and/or Academic Affairs Office upon request. Absence of more than two weeks total class time in either lecture or lab can result in your being dropped from

the course. No make-ups will be given for quizzes or exams. If you must miss a lab, attempt to come to alternate section of lab that week. A time will be scheduled late in the semester for **excused** lab absences.
Regular reading of the text is expected. Quiz material may include material from text not necessarily covered in lecture.
Cheating or helping others cheat will not be tolerated. A grade of zero will be given for the exam, quiz, or assignment. Expulsion from the course may occur.
Assignments turned in after the due date and time will be assessed a penalty equivalent to 10% per day. Assignments will not be accepted for credit after other's papers have been returned.
Cell Phones and Pagers are not permitted in class except for emergency response personnel. Please turn them off upon entering the classroom.

SOME IMPORTANT DATES TO REMEMBER:

Monday	Jan. 16	Holiday (all classes cancelled and offices closed)
Wednesday	Jan. 18	Last day to register or add classes
Mon-Fri Mar. 20-24		Spring Break
Monday	Apr. 3	Preregistration begins for Summer and Fall classes
Wednesday	Apr. 5	Last day to drop with a W
Thursday	Apr. 27	Last Day to Withdraw from Classes (W if passing, F if failing)
Tuesday May 2		Last day of classes
Wed-Tue	May 3-9	Final Exam Period

FINAL EXAM:
The final exam for 10:10 MWF courses will be Friday, May 5, 1:30 - 3:30 p.m.

SPECIAL NOTE: UAM will no longer mail grade reports to all students. You may access your grades through Campus Connect on the UAM homepage. You may fill out a form in the Registrar's Office to request a mailed grade report.

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, Room 219, phone 870–460-1154; TDD 870-460-1251; fax 870-460-1810.

Additional Reading: (Available in the UAM Library)

1) Organic Nomenclature: A Programmed Approach. 4th ed. by James G. Traynham. Englewood Cliff, NJ. Prentice-Hall. 1991.
2) Organic Chemistry, The Name Game: Modern Coined Terms and their Origins. by Alex Nickon. New York, NY. Pergamon Press. 1987.
3) Commission on the Nomenclature of Organic Chemistry. by The Union of Pure and Applied Chemistry. 1971.
4) Chemical Bonding Theory. by Brian C. Webster. Boston, MA. Blackwell Scientific Publications; Brookline, MA. 1990.
5) Acid-Base Behavior in Aprotic Organic Solvents. by Marion Maclean Davis. 1968.
6) Elements of Stereochemistry. by Ernest Ludwig Eliel. New York, NY. Wiley. 1969.
7) Stereochemistry of Carbon Compounds. by Ernest Ludwig Eliel. New York, NY. McGraw-Hill. 1962.
8) Introduction to Stereochemistry. by Kurt Mislow. New York, NY. Benjamin. 1965.
9) Symmetry: A Stereoscopic Guide for Chemists. by Ivan Bernal. San Francisco, CA. W.H. Freeman. 1972.
10) Principles of Organic Synthesis. by R.O.C. Norman. 3rd edition. James Coxon. 1993.
11) Name Reactions and Reagents in Organic Synthesis. by Bradford P. Mundy. New York, NY. Wiley. 1989.
12) The Logic of Organic Synthesis. by E.J. Corey. New York, NY. Wiley. 1989.
13) Designing Organic Synthesis: A Programmed Introduction to the Synthon Approach. by Stuart G. Warren. New York, NY. Wiley. 1978.
14) Organic Synthesis: The Disconnection Approach. by Stuart G. Warren. New York, NY. Wiley. 1982.

This laboratory is a required portion of Organic Chemistry and may not be taken separately. It is worth 150 points of a possible 800 points for the course, so it has a large impact on your overall course grade.

Lab Schedule:

Week of	#	Title
Jan 11		Lab Check-in / Clean up / Notebook /Report Discussion
Jan 18		Introduction to IR and MS / Spectroscopy Problem Set
Jan 25	14	NMR /IR/MS and determination of unknowns
Feb 2		Lecture Exam 1 (NO LAB)
Feb 8, 15	13	Friedel Craft Acylation: Prep. of Acetophenone
Feb 22	15	Oxidation: Prep. of Cyclohexanone
Mar 2		Lecture Exam 2 (NO LAB)
Mar 8	17	Esterification 1: Prep. of Aspirin
Mar 15	18	Esterification 2: Oil of Wintergreen
Mar 29	16	Derivatives of Carbonyl compounds
April 5		Lecture Exam 3 (NO LAB)
April 12	12	Grignard Synthesis of an alcohol
April 19		Make up day & Get unfinished experiments completed
April 24		Note books due at 10:15 a.m. Any after that time is considered late by 1 day. A penalty of 10% per day will be assessed on late notebooks.
Apr 24		Lab exam....given during lecture period
May 1		Lecture Exam 4 (NO LAB)

Grading:

The laboratory notebook is worth 25 points
The laboratory exam is worth 50 points
The pre/post lab assignments will be combined for a score worth 25 points.
The lab reports will be combined for a score worth 50 points
Your overall lab score will be calculated as a sum of the points scored on the three items above and used in calculating your overall grade for Organic Chemistry. See page 1 of the syllabus.

Safety Warning: This course involves the frequent use of organic chemicals and solvents. Both short and long term health hazards are associated with the use of all chemicals. Organic chemicals and solvents because of their volatility typically pose greater health risks. These health risks are significiantly higher for students with asthma, chemical allergies, and students who are pregnant. Safety glass, gloves, and masks are available and can lower, but not eliminate, health hazards in lab. However, it is the student's responsibility to follow all safety rules and use safety equipment in order to minimize health risks

Organic Laboratory Rules and Notebook Outline

Laboratory Notebook:

Keeping a proper laboratory notebook is an part of succeeding in Organic Chemistry Lab. Chapter 2 of the Organic Chem Lab Survival Manual provides an excellent outline for keeping a lab notebook.

Some of the more important reminders are:

1) The lab notebook must have a sewn binding..... not loose leaf or spiral bound
2) Number every page in your notebook if they are not already numbered
3) Leave pages 1, 2, and 3 blank... these will serve as a title page and table of contents when the notebook is ready to turn in.
4) Under no circumstances are pages to be torn out of your notebook
5) Always use waterproof, blue or black, ink.
6) The lab notebook is to be written as a continuous journal of experiments conducted in lab. Write on both sides of the page. Never skip pages. If inevitable, then put a large X on the page and the date.
7) Never erase, use white-out, or obliterate an erroneous entry. Place a single line through the erroneous entry.
8) Be thorough. Drawings, tables, calculations, and detailed descriptions are expected. These should be well labeled. If graphs are added, they should be **taped** in with nothing hanging outside the notebook.
9) Always sign and record the date on the page anytime something is written in the notebook.
10) Have the prelab write completed before coming to lab. Write data and observations during lab. Obtain instructor's initials on your work before leaving lab.

Information needed in notebook:

I. Title of Experiment (be specific)
II. Purpose of Experiment (brief paragraph)
III. Chemical Reactions (if any)
IV. Table of Reagents, giving *pertinent* physical information. m.p., b.p., solubility, amount used in grams and moles, and brief safety notes. Tables will vary depending on the experiment. Don't try to use one standard format for every experiment. Pertinent information will depend on the experiment.
V. Outline of procedure
VI. Notes from Pre-lab lecture including announced changes in the procedure.
VII. Data, Calculations, and Observations
VIII. Conclusions

Parts I - V will be completed **before** coming to lab. Parts VI and VII will be completed **during** lab. Often conclusions cannot be written until other information is obtained, such as mass, melting point, etc..

Coming to lab without the proper preparation may result in you not being allowed to do the lab. Coming to lab late may also result in you not being able to do the experiment at that time.
If you are acting in an unsafe manner, the instructor may ask you to leave the laboratory.

SEE THE ORGANIC LAB SURVIVAL GUIDE FOR MORE TIPS ON WRITING A GOOD LABORATORY NOTEBOOK

Appendix III

Course Syllabus Outline- Spring 2007 -
School of Mathematical and Natural Sciences -

Course Title: Biology 3434, Regional Flora/Regional Flora Lab
Lecture, T Th 9:40 am- 11:00 am, SC B 19
Lab, T Th 1:40 pm- 4:30 pm, SC B 32

Prerequisite: Biology 1143, Biology 1171

Textbook: Walters, D.R., Keil, D.J., & Z.E. Murrell. *Vascular Plant Taxonomy*, ed. 5. 2006
Lab Text: Smith, E.B. *Keys to the Flora of Arkansas*. 1994.

Instructor: Karen Fawley, Ph.D.
Office: Museum of Natural History
Office hours: T, 11-1pm; W, 1pm-4pm; Th, 11am-1pm; F, 9am-11am
Walk in, or by appointment
E-mail: fawley@uamont.edu
Phone: 870-460-1165

Objectives: To familiarize students with our local vascular plants, with methods of plant identification and specimen collection, and with the principles and methods of plant classification and nomenclature.

Course Outline:

Date		Lecture Topic	Chapter Readings from *Vascular Plant Taxonomy*
T	Jan 16	Introduction to Plant Taxonomy	Ch. 1
Th	Jan 18	Botanical Nomenclature	Ch. 2
T	Jan 23	Taxonomic Evidence	Ch. 3
Th	Jan 25	Taxonomic Evidence	Ch. 3
T	Jan 30	Phylogenetic Classification	Ch. 4
Th	Feb 1	Floras, Manuals and Botanical Descriptions	Ch. 5
T	Feb 6	Artificial and Phenetic Systems of Classification	Ch. 6
Th	Feb 8	Exam I	Chs. 1-6
T	Feb 13	Collecting and Preserving Plants for Study	Ch. 7
Th	Feb 15	Survey of Vascular Plants	Ch. 8

T	Feb 20	Lycophytes and Seed Free Plants	Ch. 9
Th	Feb 22	Gymnosperms	Ch. 10
T	Feb 27	Introduction to the Flowering Plants	Ch. 11
Th	Mar 1	Introduction to the Flowering Plants	Ch. 11
T	Mar 6	Exam II	Ch. 7-11
Th	Mar 8	Early Evolution of Flowering Plants: Basal Angiosperms, Magnoliids, and Basal Eudicots	Ch. 12
Week of March 12-16		Spring Break!	
T	Mar 20	The Carophyllid Clade	Ch. 13
Th	Mar 22	The Carophyllid Clade	Ch. 13
T	Mar 27	Rosids	Ch. 14
Th	Mar 29	Rosids	Ch. 14
T	Apr 3	Rosids	Ch. 14
Th	Apr 5	Asterids	Ch. 15
T	Apr 10	Asterids	Ch. 15
Th	Apr 12	Exam II	Chs. 12-15
T	Apr 17	Monocots	Ch 16
Th	Apr 19	Monocots	Ch 16
T	Apr 24	Experimental Plant Systematics	Ch. 17
Th	Apr 26	Experimental Plant Systematics	Ch. 17
T	May 1	Lab practical exam	

Plant Collection due: Tuesday, April 24
Lab practical exam: Tuesday, May 1
Final lecture exam: Thursday, May 3, 2007, 1:30-3:30 pm

Grading Policy:

		Grading scale	
Lecture exams	20%	90-100	A
Lab quizzes/Lab assignments	20%	80-89	B
Plant collection	20%	70-79	C
Cumulative final exam	20%	60-69	D

Lab practical exam	20%	Below 59 F

Field Trips: Two or three afternoon field trips to areas of botanical interest will be taken during class time (possibly extending to 6 p.m.). Attendance is required. Make-up for missed afternoon field trip: a 5 page library research paper. Precise dates and destinations will be announced.

Class Attendance: Attendance will be taken during every lecture and lab period. In general, students who attend class regularly make better grades. As a courtesy to the students in the class and the instructor, please be on time. Biology 3434 lecture begins at 9:40 am, and Biology 3434 lab begins at 1: 40 pm.

Rescheduling Exams: If you are unable to take an exam at the scheduled time, please notify the instructor well before the day of the exam to reschedule at an earlier time.

Make-up Exams: Students can make-up one exam only, if they have a valid medical or personal excuse. Medical excuses must be accompanied by written verification of a doctor's visit on or before the day of the exam, if possible. All make-up exams will be given on the last day of class, Tuesday, May 1, 2007. No make-up quizzes.

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.

Cheating: Cheating will not be tolerated. The policy found on page 63 of the catalog, under Academic Code Violations will be applied to students guilty of cheating on exams.

Classroom Policies: Use of tobacco products is not permitted inside the Science Center or within 25 feet of entry doors. Students should not write on the desks. Scores on exams will be posted on the instructor's web site, http://www.uamont.edu/facultyweb/fawley, by a code number assigned on the first exam unless a student requests not to have his/her scores posted. **Cell phones and pagers will be turned off during class.**

Dates to Remember:

Wednesday, January 10	First day of classes. -
Monday, January 15	Martin Luther King Holiday -
Wednesday, January 17	Last day to register or add classes. -
Wednesday, February 28	Deadline to file for August or - December graduation.
Monday-Friday, March 12-16	Spring break
Monday, April 2	Preregistration for Summer and Fall 2007 begins.

Wednesday, April 4	Last day to drop W. -
Friday, April 13	Preregistration for Summer and Fall 2007 ends.
Thursday, April 26	Last day to withdraw from class.
Tuesday, May 1	Last day of classes.
Wednesday-Tuesday, May 2-8	Final exam period.
Friday, May 11	Commencement

The following action is prohibited under the Student Conduct Code: 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.

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 in Harris Hall Room 120; phone 870 460-1026; TDD 870 460-1626; Fax 870 460-1926.

Appendix IV

SCHOOL OF MATHEMATICAL & NATURAL SCIENCES COURSE SYLLABUS
CALCULUS II (MATH 2264) FALL 1998

INSTRUCTOR	**OFFICE**	**OFFICE HOURS**
Dr. Earl Packard	Science Center B 14	MWF 10:00 - 11:00 WF 2:00 - 3:00
	Phone 460-1664	TTH 9:30 - 11:00 TTH 1:00 - 2:30
		or by appointment

MEETING TIMES AND LOCATIONS: MWF 8:10 - 9:00 Science Center B3 (lectures)
M 2:10 - 4:00 (laboratory)

REQUIRED TEXT & MATERIAL: Calculus, by Bradley & Smith, Prentice-Hall

OPTIONAL MATERIAL: See page xvii of the required text for the supplementary materials. A graphing calculator such as the TI-82, or better, is recommended. **A computer algebra program will be used as an exploratory and expository tool in this course.**

COURSE PREREQUISITES: A grade of C or better in Calculus I (Math 2254)

COURSE GOALS:

I. To learn applications and techniques of integration.
II. To understand differentiation, integration, and applications for exponential, logarithmic, hyperbolic, inverse trigonometric, and inverse hyperbolic functions.
III. To learn sequences and series of real numbers and power series representations of real-valued functions.

COURSE CONTENT & SCHEDULE OUTLINE:

Chapter 5 - Exponential, Logarithmic, and Inverse Trigonometric Functions
Chapter 6 - Additional applications of the Integral
TEST 1 (100 points)

Chapter 7 - Methods of integration
TEST 2 (100 points)

Chapter 8 - Infinite Series
TEST 3 (100 points)

Chapter 9 - Polar Coordinates and Parametric Forms
TEST 4 (100 points)

Final Exam (comprehensive) - 200 points:
Thursday, December 10, 1998, 8:00 - 10:00 am

GRADING:

There are a maximum of 700 total points possible in this course: 100 points possible in each of the in-class tests, 200 points in the final exam, and 100 points for homework/quizzes and lab work. The grading scale is as follows:

90 - 100% ~ A, 80 - 89% ~ B, 70 - 79% ~ C, 60 - 69% ~ D, < 60% ~ F

POLICIES:

1. Once each week there will be a quiz consisting of several homework problems from the previous week's assignment. You will be allowed to use your completed homework assignment in the quiz. **Therefore, although homework is not collected, it is necessary to complete all homework assignments. There will be no makeup quizzes.**

2. If one exam is missed the percentage grade of the final exam will substitute for the grade of that exam. If no exams are missed the percentage grade of the final may substitute for the lowest exam grade if the final exam percentage is higher. If two (or more) exams are missed a grade of **zero** will be given for the second (and subsequent) tests missed. **If the final exam is missed your course grade will be F regardless of previous work in the course. There are no makeup tests.**

3. Cheating and plagiarisms are unacceptable activities and a grade of **zero** will be given for any case of verified cheating. In addition, all occurrences will be reported to the Vice Chancellor for Academic Affairs for other possible actions.

4. You are expected to attend all class meetings and laboratories and make a serious attempt at all assigned work. If six (or more) absences accumulate you may be removed from the course (possibly withdrawn failing). **There are no excused absences.**

EXPECTATIONS OF THE STUDENT: The calculus student is expected to have a working knowledge of algebra and trigonometry. While calculus is not particularly difficult for the diligent student, concepts and topics beyond the scope of algebra and trigonometry are developed in this course. It is necessary to diligently work **all** homework assignments. Many concepts are built on previous concepts. Seek help (from me or from the tutoring lab) as soon as you encounter a difficulty.

IMPORTANT DATES

Wednesday, August 19, 1998		First day of class
Tuesday, August 25, 1998		Last day to register or add classes.
Monday, September 7, 1998		Labor Day Holiday
Monday, October 7, 1998		Pre-registration for Spring 1999 begins.
Wednesday, November 4, 1998		Last day to drop with W.
Friday, November 13, 1998		Pre-registration for Spring 1999 ends.
Wednesday, November 18, 1998		Deadline to file for Fall graduation.
November 26 - 27, 1998		Thanksgiving Holiday.
Tuesday, December 1, 1998		Last day to withdraw from class.
Friday, December 4, 1998		Last day of class.
Thursday, December 10, 1998	**8-10 am**	**Comprehensive Final Exam.**

UAM is committed to providing equal educational opportunities for all students. Students with disabilities who require special accommodations should discuss their needs with the Coordinator of Special Student Services, 122 Harris Hall (Phone 870-460-1154, TDD 870-460-1251, fax 870-460-1810).