University of Arkansas at Monticello

Academic Unit Annual Report

Unit: School of Mathematical and Natural Sciences

Academic Year: 2023 - 2024

State your unit's Vision, Mission and Strategic Plan including goals, actions and key performance indicators (KPIs).

Unit Mission: 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, pharmacy, and veterinary medicine. 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, psychology, and wildlife management.
5. To serve the general education program through courses in biology, chemistry, earth science, mathematics, physics, and physical science that provide a basic background for a baccalaureate degree.

Unit Vision: The School of Mathematical and Natural Sciences comprises the disciplines of biology, chemistry, computer science, earth science, mathematics, mathematics education, physical science, physics, and science education. The School has majors in Biology, Chemistry, Mathematics, and Natural Sciences. The School strives to maintain and develop relevant programs to supply southeast Arkansas and surrounding areas with qualified and excellent workers. The School also strives to remain among the top

universities in Arkansas to have students admitted in medical school, pharmacy school, and other graduate programs.

Unit Strategic Plan including KPIs (please distinguish new goals from continuing goals.)

In Table 1, assess your unit's progress toward meeting Strategic Plan goals during the past academic year and what changes might you consider in order to make additional progress in the coming year. KPIs should be quantifiable—for example, a goal of increased enrollments should be measured by a specific number or percentage; if school visits are part of a recruitment effort, say how many school visits are your goal; if your goal is to see an improved success rate in a class, by what percentage do you hope to see the success rate increase? Your goals are what you want to achieve. Your KPIs are how you measure your degree of success.

Table 1: Assessment of Key Performance Indicators

KPI	Assessment of Progress	Implications for Future Planning/Change
Increase online course offerings by 2 courses.	Introductory Chemistry and Lab, Introduction to Biology and Lab, College Algebra, Quantitative Literacy, Quantitative Literacy with Review, Meteorology, Oceanography, and General Chemistry I and Lab have become online staples. Enrollment in these courses continues to remain steady. College Physics I and II, Calculus I, Trigonometry, Intro to Statistics, and Anatomy and Physiology I and II were introduced as online courses this year. Enrollment in all but Calculus I was enough to sustain separate offerings without them being tied to the face-to-face section, and our hope is that this will continue or improve.	Eventually more math classes will be added to the schedule as online offerings since the BS Mathematics is marketed as online.
Increase assessment participation to 100% of the included courses.	Last year, 9 of the 11 courses used for assessing Communication and Critical Thinking participated and offered data.	Although there is a significant decrease in the number of courses used for Teamwork and Global Learning compared to the number of courses used for Communication and Critical Thinking, the goal is that all five courses that were offered this year and the online courses will submit their assessment data this year.

KPI	Assessment of Progress	Implications for Future Planning/Change
Increase the number of Mathematics graduates to at least 4 per year to meet program viability.	This past school year met this goal by having exactly 4 graduates receive a Math degree.	Between the 3 BS Math degrees and the two new AS Math degrees, SMA hopes to see at least 4 graduates in math per year henceforth.
Continue having acceptance rates of at least 90% into medical school, pharmacy school, allied health programs, and graduate programs.	Thus far this year, 3/3 students have successfully applied to medical school, 1/1 student who applied for pharmacy school has been accepted, and 2/2 students in Allied Health fields were accepted into their programs.	The aim is for this to continue indefinitely, and SMS hopes to track Allied Health students more efficiently.

In Table 2, show the alignment of your academic unit's Student Learning Outcomes (SLOs) with UAM's Institutional Learning Outcomes (ILOs) and UAM's and your Unit's Vision, Mission, and Strategic Plans

Table 2: Unit Student Learning Outcomes

University Institutional Learning Outcomes	Unit Student Learning Outcomes related to each University ILO	Alignment with UAM Vision, Mission and Strategic Plan	Alignment with Unit Vision, Mission, and Strategic Plan
Communication: Students will communicate effectively in social, academic, and	Be able to clearly express mathematical and/or scientific ideas in oral and written communication.	These skills are necessary for our graduates to contribute to the economic and quality of life indicators in the community, state, and region.	The curricula in Math and Sciences are the foundations for the content knowledge needed for the SLO. The upgrading of the major program requirements is important in keeping the programs up to date and relevant.

University Student Learning Outcome (Institutional Learning Outcome)	Unit Student Learning Outcome (may have more than one-unit SLOs related to each University SLO; List each one)	Alignment with UAM/University Vision, Mission and Strategic Plan	Alignment with Unit Vision, Mission, and Strategic Plan
professional contexts using a variety of means, including written, oral, quantitative, and/or visual modes as appropriate to topic, audience, and discipline.			
Critical Thinking: Students will demonstrate critical thinking in evaluating all forms of persuasion and/or ideas, in formulating innovative strategies, and in solving problems.	Have a core knowledge of the major discipline. Be able to demonstrate the ability to apply scientific and/or mathematical concepts to real world situations.	This is the basis for our graduates to succeed in a global environment, be successful in entrepreneurial endeavors, and be a productive member of the community.	SMS provides opportunities for students to improve their understanding of math and science concepts and provide proper training in these concepts in our support courses to other academic units.
Global Learning: Students will demonstrate sensitivity to and understanding of diversity issues pertaining to race, ethnicity, and gender and will be capable of anticipating how their actions affect campus, local, and global communities.	Be prepared for immediate employment in a scientific, technical, medical, or educational environment. Be prepared to enter graduate or professional school in the appropriate area.	This is the basis for our graduates to succeed in a global environment, be successful in entrepreneurial endeavors, and be a productive member of the community.	Math and Sciences wants to educate students to better understand the role of science in events around the world and locally.
Teamwork: Students will work collaboratively to reach a common goal and will demonstrate the characteristics of productive citizens.	Be prepared to work with others to accomplish a common goal. Learn how science is conducted between two members of the same faculty. Learn how science is conducted	This is the basis for our graduates to succeed in a global environment, be successful in entrepreneurial endeavors, and be a productive member of the community.	Our goal is to prepare students for their future professions and to ensure that knowledge of proper procedure for collaboration is obtained to further the advancement of the math and science fields.

University Student Learning Outcome (Institutional Learning Outcome)	Unit Student Learning Outcome (may have more than one-unit SLOs related to each University SLO; List each one)	Alignment with UAM/University Vision, Mission and Strategic Plan	Alignment with Unit Vision, Mission, and Strategic Plan
	between two or more members of differing universities.		

UNIVERSITY AND PROGRAM ASSESSMENT

Describe with specific details how Student Learning Outcomes are assessed in your unit and how the results/data are used for course/program/unit improvements?

The Student Learning Outcomes (SLOs) are measured in our courses through student performance on exams, quizzes, laboratory exercises, field course journals, homework assignments, research projects, reports, and presentations. Further assessment is done using performance on nationally normed examinations such as the American Chemical Society (ACS) standardized final examinations and pre-professional placement exams such as the GRE, PCAT, MCAT, OAT, and DAT and post graduate placement into graduate programs, professional programs, and employment. Recently, some professional programs removed the requirement of the standardized test score, such as the PCAT for pharmacy.

The courses were identified for assessment, and each course instructor included in assessment selected an assignment or group of assignments that would be used to assess the student learning outcome chosen. Using the appropriate rubric, information would be provided on students in those courses. The courses and SLOs selected are shown in the following tables:

AACU RUBRIC DATA

Global Learning

Context/course in which assessment was done: Earth and Atmosphere

Dimension	# of students scoring 4	# of students scoring 3	# of students scoring 2	# of students scoring 1	# of students scoring 0	Average score for class/activity	Total # of students assessed in unit
Global Self-Awareness							N/A
Perspective Taking							N/A
Cultural Diversity							N/A

Dimension	# of students scoring 4	# of students scoring 3	# of students scoring 2	# of students scoring 1	# of students scoring 0	Average score for class/activity	Total # of students assessed in unit
Personal and Social Responsibility	6	14	30	0	0	2.52	50
Understanding Global Systems							N/A
Applying Knowledge to Contemporary Global Contexts							N/A

Description of assignment used in the assessment: An Earth System Global Awareness Essay was assigned to the Spring 2024 Earth & Atmosphere lecture courses: *Understanding how Earth's interconnected systems interact, respond to, and cause global changes is vital to the future of the nation and the world. Research ways the biosphere, hydrosphere, geosphere and atmosphere interact. Write two separate paragraphs (at least 200 words per paragraph, spell- and grammar—checked) on:*

1) Select a significant global issue in the natural world and identify ways that human actions influence the Earth system.

2) Evaluate the global impact of your specific local actions on the natural world.

What do the data indicate about strengths, weaknesses, opportunities for growth and threats to effectiveness regarding student performance?

Strengths: The strength of the assessment is that all students selected significant global issues and articulated human influence on the natural world.

Weaknesses: Freshmen and sophomore students seemed to take the assignments more seriously than their junior and senior classmates and scored higher.

Opportunities for Growth: Most students who are not STEM majors try to wait to take their General Education science courses. This means that, by their junior and senior years, they are more focused on their major courses and do not devote as much time to the assignments. Encouraging students to take their science courses earlier in their career may impact the results of this assessment in a positive way.

Threats to Effectiveness: The majority of students will take only one earth science course in their college career, so opportunities for growth in the subject is unlikely.

What actions, if any, do you recommend that might improve student performance in this learning outcome?

First, instructors will reword the 2nd point in the assessment to better convey that the student must evaluate their specific actions (such as this means YOU) on the natural world since a vast majority did not evaluate this and gave only general human actions or their hometown community's actions which resulted in those students receiving the 2- Milestone assessment rating.

Second, instructors will post resource documents into Blackboard of the various topics discussed during the term regarding global awareness so students will have a resource bank to draw from as they prepare for the assignment.

Third, instructors could make the assignment worth more points to stress the importance of the assignment, an adjustment that will hopefully encourage them to try their best.

What revisions, if any, to the assessment process do you recommend that might help us to acquire more useful data in this learning outcome?

The assessment assignment aligns very well with the learning outcomes for the Earth and Atmosphere Lecture course. Instructors could spend more time explaining the criteria (value rubrics) to students to help them realize that this assessment is an evaluation of a deeper understanding of environmental global issues.

Global Learning

Context/course in which assessment was done: Climate Change

Dimension	# of students scoring 4	# of students scoring 3	# of students scoring 2	# of students scoring 1	# of students scoring 0	Average score for class/activity	Total # of students assessed in unit
Global Self-Awareness	2	2	1	5	0	2.1	10
Perspective Taking							N/A
Cultural Diversity							N/A
Personal and Social Responsibility	9	0	0	1	0	3.8	10
Understanding Global Systems							N/A
Applying Knowledge to Contemporary Global Contexts							N/A

Description of assignment used in assessment: On the comprehensive final exam, the instructor used two open-response questions to evaluate which levels the students had reached. The questions were:

1. One of the messages of this class has been that actions of single persons will not be enough to solve the climate crisis—it will take governmental and societal will. However, there are some things that individuals can do. Please list at least three actions that you can take to have an effect.

2. Solving climate change will take concerted action from several scales (individual, local, national, and international). At which of these levels will the most important actions occur? Suggest specific actions and defend your answer.

What do the data indicate about strengths, weaknesses, opportunities for growth and threats to effectiveness regarding student performance?

Strengths: This type of assessment was easy to use, as the University rubrics closely followed the learning objectives of the class. It also allows the instructor to evaluate teaching techniques and to change the delivery of materials somewhat the next time the class is offered to emphasize the Global Learning ideas.

Weaknesses: A disadvantage of the assessment is that this is only the second time the class has been offered, and so there is no comparison with previous iterations to determine whether improvement in the course learning objectives is being accomplished.

Opportunities for Growth: Further use and refinement of these metrics will make this assessment more useful in the future.

Threats to Effectiveness: Class size is small, and there is no way to control for the educational level (freshman, sophomore, junior, senior, graduate). Because class size is small, a small number of students who are unprepared or over-prepared compared to the rest of the students will skew results. Several years of data should be compiled before making any major generalizations about the course.

What actions, if any, do you recommend that might improve student performance in this learning outcome?

As stated, the instructor will change delivery of materials to emphasize the Global Learning data.

What revisions, if any, to the assessment process do you recommend that might help us to acquire more useful data in this learning outcome?

Instructors should be consulted before assessment criteria are assigned to a particular course. Aims of particular courses might have little or nothing to do with the objectives being evaluated. In this case, the objectives of evaluation lined up well with those of the course.

Teamwork

Context/course in which assessment was done: General Ecology

Dimension	# of students scoring 4	# of students scoring 3	# of students scoring 2	# of students scoring 1	# of students scoring 0	Average score for class/activity	Total # of students assessed in unit
Contributes to Team Meetings	4	5	0	1	1	2.9	11

Dimension	# of students scoring 4	# of students scoring 3	# of students scoring 2	# of students scoring 1	# of students scoring 0	Average score for class/activity	Total # of students assessed in unit
Facilitates the Contributions of Team Members	3	4	3	0	1	2.7	11
Individual Contributions Outside of Team Meetings	0	3	6	1	1	1.5	11
Fosters Constructive Team Climate	2	1	3	4	1	1.9	11
Responds to Conflict	2	3	3	2	1	2.3	11

Description of assignment used in assessment: Assessment was based on weekly involvement with paper discussion in lab. Students were assigned weekly readings of scientific papers that they were expected to discuss during lab time and then follow up with a two-page summary of what they read.

What do the data indicate about strengths, weaknesses, opportunities for growth and threats to effectiveness regarding student performance?

Strengths: As suspected, the strongest area was in how students contribute to discussions.

Weaknesses: The lowest area was "Fosters Constructive Team Climate," but this was expected as most students at this level are cooperative and trying to do as asked.

Opportunities for Growth: In the future, allowing students to choose and lead discussions more will be a goal. This will give them a greater investment in the process.

Threats to Effectiveness: Artificial intelligence generated writing assignments probably pose the greatest obstacle in these courses. Students' ability

to read and concisely summarize the information is important to the discussion process.

Teamwork

Context/course in which assessment was done: General Chemistry I Lab

Dimension	# of students scoring 4	# of students scoring 3	# of students scoring 2	# of students scoring 1	# of students scoring 0	Average score for class/activity	Total # of students assessed in unit
Contributes to Team Meetings	0	2	9	3	0	1.93	14
Facilitates the Contributions of Team Members	0	2	7	5	0	1.79	14
Individual Contributions Outside of Team Meetings	0	0	0	11	3	0.79	14
Fosters Constructive Team Climate	0	0	4	10	0	1.29	14
Responds to Conflict	0	2	7	5	0	1.79	14

Description of assignment used in assessment: During the semester, three of nine experiments were conducted as small groups of 2 to 5 students. The three experiments allowed ample opportunity to observe the students and how they worked as a team. The instructor took these observations into consideration to assign the corresponding rubric values.

What do the data indicate about strengths, weaknesses, opportunities for growth and threats to effectiveness regarding student performance?

Strengths: This group of students were somewhat adaptable to working in groups/working as a team. The majority of the students were easygoing in terms of being able to pivot from individual work to teamwork. A few "leaders" emerged in the class as the students willing to more readily voice their opinions and help direct the groups.

Weaknesses: Lack of teamwork skill development. This could be possibly due to covid restrictions in formative years of high school or due to decreased social interactions as a whole in the academic world and the world in general. It was clear that quite a few of these students have not had much opportunity to work in groups.

Opportunities for Growth: With more ample opportunities, these students will be able to work more efficiently in groups and contribute more.

Threats to Effectiveness: COVID prevented the students from doing an adequate amount of teamwork.

What actions, if any, do you recommend that might improve student performance in this learning outcome?

Possible courses of action could include doing more group work activities to increase their teamwork abilities. Another option could be to assign groups for the work and to swap the group assignments around throughout the semester so that the students get exposure to working with various groups of students (varying personalities and possibly varying their role in the groups).

What revisions, if any, to the assessment process do you recommend that might help us to acquire more useful data in this learning outcome?

This is a difficult element to assess because it is very subjective. Certain experiments in sections done individually can be analyzed compared to the performance of the teams working on the same experiment. But the variations in performance could also be attributed to variations in the composition of the sections. Another option would be to compare individually completed experiment performance to group performance. But again, subjectivity plays a role because the experiments vary in difficulty. It could be that this course itself is not well suited for this assessment element. A course where there is a larger group project would likely be a better fit.

Teamwork

Context/course in which assessment was done: Biochemistry Lab

Use separate tables for separate courses.

If a dimension was not assessed, leave the row blank. If the ILO was not assessed, delete the table.

Dimension	# of students scoring 4	# of students scoring 3	# of students scoring 2	# of students scoring 1	# of students scoring 0	Average score for class/activity	Total # of students assessed in unit
Contributes to Team Meetings	3	4	0	0	0	3.4	7
Facilitates the Contributions of Team Members	2	5	0	0	0	3.3	7
Individual Contributions Outside of Team Meetings							N/A
Fosters Constructive Team Climate	5	2	0	0	0	3.7	7
Responds to Conflict	5	2	0	0	0	3.7	7

Description of assignment used in assessment: Monitored students during a specified laboratory meeting.

What do the data indicate about strengths, weaknesses, opportunities for growth and threats to effectiveness regarding student performance?

Strengths:

- Students demonstrated effective teamwork and communication, contributing to the successful completion of projects and assignments.
- Many students excelled at encouraging and supporting their peers to share their ideas and contributions, fostering an inclusive team environment.

Weaknesses:

- Not all students contributed equally to the team efforts, leading to imbalances in workload and slower progress.
- At times, there were no clear roles in teams and assignment of tasks, such as identifying a leader or task coordinator.

Opportunities for Growth:

- Establishing specific roles and clear directions within teams can ensure that all students contribute effectively and that tasks are evenly distributed.
- Creating an environment that promotes open communication and conflict resolution will help teams navigate challenges and maintain productivity.

Threats to Effectiveness:

- The restricted time allocated for lab sessions may prevent thorough exploration and understanding of complex biochemical concepts and contexts.
- Limited access to advanced materials and instruments has affected efficiency and progress but has also increased the ability of teams to adapt and problem solve.

Online Class Assessment Based on Simplified OSCQR: Unit Summary

Fill in unit totals in each box below; summarize action plans (if any are needed) for each Standard; do SWOT analysis based on this data.

Standard	Sufficiently Present	Minor Revision	Moderate Revision	Major Revision	Not Applicable	Action Plan Summary
1.Welcome, overview and information						
1.1 It's clear how students contact the instructor and how and when students attend class and submit assignments.	20	2	0	0	0	
2.Course Organization						

2.1. The course is organized into modules, units, weeks, or other chunks. Each section has due dates and expectations clearly stated.	20	2	0	0	0	
3.Accessibility						
3.1. At a minimum, videos should have automatically generated captions that have been reviewed for accuracy by the instructor.	7	9	0	0	6	
3.2. Blackboard Ally reports have been used to identify and remediate course content for improved accessibility.	7	6	2	1	6	
4.Course Activities						
4.1. Course activities should encourage collaboration between students whether through discussion boards, synchronous sessions, or group projects.	4	7	2	0	9	
4.2. Course activities encourage learners to develop higher-order	19	3	0	0	0	

thinking and problem solving skills, such as critical reflection or analysis.						
5.Interaction						
5.1. Expectations for timely and regular feedback from the instructor are clearly stated.	21	1	0	0	0	
5.2. Expectations for interaction are clearly stated.	20	2	0	0	0	
5.3. Learners have the opportunity to get to know the instructor.	15	5	2	0	0	
5.4. Course offers opportunities for learner-to-learner interaction and constructive collaboration.	10	2	3	0	7	
6.Technology Requirements						
6.1. Students are provided detailed information and instructions regarding technology, and faculty point students to support for any technology not managed by the UAM IT department.	19	1	0	0	2	
6.2. If there are technology requirements for	14	2	1	0	5	

assignments or exams, a practice assessment is included.						

Based on the numbers in the table above, what conclusions can be drawn about the quality of online classes in your academic unit?

Strengths: Courses in this unit are well designed with Welcome modules, students are instructed on how to contact their instructor, the assignments show an appropriate level of rigor, and students have opportunities to get to know their instructor.

Weaknesses: Lack of accessibility and opportunities for online students to collaborate with each other.

Opportunities: To expand the types of assignments given and to ensure that assignments and presentations are in their most accessible format by employing accessibility software.

Threats: The biggest threat to online course success is student participation. Students sometimes believe that they can do less work and study much less in an online course and still pass the course. One threat that has been rectified for the upcoming academic year is the need for monitoring software. The only other option to ensure academic honesty is to send students to a testing center, which can be inconvenient and costly. The university has purchased a Respondus Lockdown browser and monitoring to aid in this process.

To what extent do you believe your unit's online classes meet the federal government's requirements for "regular and substantive"? The following link provides definitions and guidance regarding the requirements: https://oscqr.suny.edu/rsi/.

The online courses in this unit very closely adhere to the federal government's requirements in some areas while lacking in others. The unit is strong about creating rigorous assignments, grading the assignments and providing feedback, and in communication with the students through office hours and more. The unit could build on more faculty creating their own content instead of pre-recorded videos by third parties.

Data-based Unit Changes

Summarize all of your unit changes predicated on assessment data.

In the laboratory courses, a greater variety was introduced in the types of lab experiments performed, and more examples and practice were given in the upper-level laboratory courses to assist in the ability to record lab books and write scientific articles. In the upper-level math course assessed, more time was allotted for problem solving during class time so that the students are more familiar with the

content. The upper-level math classes incorporated more opportunities for individual presentations so that assessing the individuals will be easier. Based on performance on the American Chemical Society Standardized Organic Chemistry final exam, spectroscopy was introduced in Organic Chemistry I instead of Organic Chemistry II and more practice was given so that student scores in that area improve.

Public/Stakeholder/Student Notification of SLOs

List all locations/methods used to meet the HLC requirement to notify the public, students and other stakeholders of the unit SLO an. (Examples: unit website, course syllabi, unit publications, unit/accreditation reports, etc.)

- Posted in the glass case at the main entrance to the Science Center
- Posted on the School of Math and Sciences website at http://uam-web2.uamont.edu/pdfs/mnsciences/mns%20student%20learning%20outcomes.pdf
- Annual assessment reports located on the Math and Sciences webpage uamont.edu
- Course syllabi

Enrollment

Table 3: Number of Undergraduate and Graduate Program Majors (Data Source: Institutional Research)

UNDERGRADUATE PROGRAM MAJOR: Biology

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Freshman	27	22	18	67/22.33	262/26.2
Sophomore	18	15	16	49/16.33	152/15.2
Junior	16	13	13	42/14	143/14.3
Senior	7	15	12	34/11.33	160/16
Post Bach	0	0	1	1/0.33	1/0.10
Total	68	65	60	193/64.33	718/71.8

UNDERGRADUATE PROGRAM MAJOR: Chemistry

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Freshman	8	10	9	27/9	101/10.1
Sophomore	7	9	9	25/8.33	75/7.5
Junior	6	4	9	19/6.33	84/8.4

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Senior	6	6	4	16/5.33	72/7.2
Post Bach	0	0	0	0/0	0/0
Total	27	29	31	87/29	332/33.2

UNDERGRADUATE PROGRAM MAJOR: Mathematics

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Freshman	1	6	2	9/3	54/5.4
Sophomore	3	0	3	6/2	30/3
Junior	5	4	0	9/3	30/3
Senior	1	2	3	6/2	27/2.7
Post Bach	0	0	0	0/0	0/0
Total	10	12	8	30/10	141/14.1

UNDERGRADUATE PROGRAM MAJOR: Natural Science

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Freshman	5	3	3	11/3.67	89/8.9
Sophomore	4	4	2	10/3.33	49/4.9
Junior	3	3	2	8/2.67	43/4.3
Senior	4	7	0	11/3.67	49/4.9
Post Bach	0	0	0	0/0	0/0
Total	16	17	7	40/13.33	230/23

UNDERGRADUATE PROGRAM MAJOR: Pre-Engineering

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
3Freshman	5	4	3	12/4	76/7.6
Sophomore	1	1	0	2/0.67	19/1.9
Junior	4	1	0	5/1.67	8/0.8
Senior	1	0	0	1/0.33	5/0.5

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Post Bach	0	0	0	0/0	0/0
Total	11	6	3	20/6.67	108/10.8

UNDERGRADUATE PROGRAM MAJOR: Pre-Medicine

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Freshman	10	9	3	22/7.33	140/14
Sophomore	11	7	6	24/8	85/8.5
Junior	7	8	7	22/7.33	65/6.5
Senior	3	6	8	17/5.67	60/6
Post Bach	0	0	1	0/0	0/0
Total	31	30	25	85/28.33	350/35

UNDERGRADUATE PROGRAM MAJOR: Pre-Pharmacy

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Freshman	6	1	1	8/2.67	69/6.9
Sophomore	2	2	1	5/1.67	39/3.9
Junior	1	0	2	3/1	31/3.1
Senior	1	1	0	2/0.67	18/1.8
Post Bach	0	0	0	0/0	0/0
Total	10	4	4	18/6	157/15.7

UNDERGRADUATE PROGRAM MAJOR: Allied Health

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Freshman	7	5	2	14/4.67	91/9.1
Sophomore	5	6	1	12/4	49/4.9
Junior	4	4	2	10/3.33	25/2.5
Senior	3	2	0	5/1.67	18/1.8

Classification	Fall 2021	Fall 2022	Fall 2023	3-Year Total & Average	10-Year Total & Average
Post Bach	0	0	0	0/0	0/0
Total	19	17	5	41/13.67	183/18.3

What do the data indicate regarding strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths:

- The Biology program is still the bread and butter of the School of Math and Sciences. The number of Biology majors has remained relatively high, differing by only 5 students from the previous year.
- The data shows that students who progress in Biology beyond their freshman year are retained through the years.

Weaknesses:

- The Math program is still struggling for graduates. However, this was the first year in a while that Math met viability having 4 graduates this year.
- The number of Natural Science majors dropped by more than half. SMS uses this degree for Allied Health majors on financial aid as they need to declare a degree to receive funds. However, many in Advising do not know this and will list the students as associate degree seekers instead.
- The number of Pre-Pharmacy students is still low, but this is a national trend.

Opportunities for Growth:

- A meeting with a representative from Advising was held to be sure that students who declare non-nurse related Allied Health fields as their intention should be rerouted to Natural Science with the Life Science option in hopes that this will increase the number of Natural Science majors.
- Two new AS Math degrees were approved, Engineering Mathematics and Data Science. Now, students who come with the intention of pre-engineering will have a credential that they can earn. Hopefully this along with BS Data Science students being able to earn a credential halfway will increase the number of Math graduates.

Threats to Effectiveness:

- Attracting qualified faculty is always difficult as most scholars who have taken the past 8-10 years in earning the required degree for tenure will not accept a job where the salary is as low as it is here at UAM.
- The number one threat is the declining enrollment at UAM as a whole, a circumstance that can be attributed to the following factors:
    - Monticello is not an exciting city to live in, especially if a student is used to places such as Little Rock or areas in the

central to northern part of the state.

- The UAM general service region's student population is declining.
- The outside and inside appearances of most UAM facilities are old and very dated. They do not aid in attracting visiting prospective students. The Science Center is one of the most neglected buildings on campus.

Progression/Retention Data

Table 4: Retention/Progression and Completion Rates by Major (Data Source: Institutional Research)

Major: **Biology**	**Number**	**Percentage**
Number of majors classified as juniors (60-89 hours) in fall 2021	**16**	**100**
Number and percentage graduated in that major during 21-22 academic year	2	13
Number and percentage graduated in that major during 22-23 academic year	7	44
Number and percentage that graduated in that major during 23-24 academic year	1	6

Major: **Pre-Medicine**	**Number**	**Percentage**
Number of majors classified as juniors (60-89 hours) in fall 2021	**6**	**100**
Number and percentage graduated in that major during 21-22 academic year	0	0
Number and percentage graduated in that major during 22-23 academic year	2	33
Number and percentage that graduated in that major during 23-24 academic year	1	17

What do the data indicate regarding strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths:

- The majority of biology majors double major in chemistry, giving them very strong backgrounds in both disciplines.
- The majority of biology majors (63%) who make it to their junior year finish their degrees on time.

Weaknesses:

- Of the six biology students that have not received a Bachelor of Science, one had to quit because of a turbulent home life, one did not pass Vertebrate Physiology in Spring 2024, and the other 4 earned Certificates of Proficiency or Associate of Arts degrees.

Opportunities for Growth:

- Stronger academic advising of juniors during their junior and senior years.
- Stronger, more accurate direction of freshmen and sophomores as many come in to major in biology or pre-medicine, but have below average test scores. More attainable degree pathways should be introduced to these students upon enrollment.

Threats to Effectiveness:

- Some students choose to lighten their academic load and stay an extra year.
- Some students choose to discontinue their education and instead receive a lower degree.

Major: Chemistry	**Number**	**Percentage**
Number of majors classified as juniors (60-89 hours) in fall 2021	**7**	**100**
Number and percentage graduated in that major during 21-22 academic year	0	0
Number and percentage graduated in that major during 22-23 academic year	4	57
Number and percentage that graduated in that major during 23-24 academic year	0	0

Major: Pre-Pharmacy	Number	Percentage
Number of majors classified as juniors (60-89 hours) in fall 2021	**1**	**100**
Number and percentage graduated in that major during 21-22 academic year	0	0
Number and percentage graduated in that major during 22-23 academic year	0	0
Number and percentage that graduated in that major during 23-24 academic year	0	0

What do the data indicate regarding strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths:

- The majority of chemistry majors graduate on time (57%).
- The vast majority of chemistry majors are double majors with biology making them strong in both disciplines and more attractive to their future institutions.

Weaknesses:

- Many students who start out as biology biochemistry double majors end up dropping their biochemistry majors to lessen the difficulty of their load.
- Chemistry majors seeking the Pre-Pharmacy pathway typically do not receive a degree from UAM before being accepted into their pharmacy schools.

Opportunities for Growth:

- BBDMs could be more effectively advised into keeping their chemistry major as it does make them more marketable and attractive to professional programs.
- Faculty need to ensure that Pre-Pharmacy students are aware that they can transfer hours back to UAM so that they can earn the bachelor's degree and their professional degree simultaneously.

Threats to Effectiveness:

- The main threat to effectiveness is the number of students that drop their chemistry degree to lessen their load.
- The lack of modern instrumentation makes it difficult to recruit into this degree as well.

Major: Mathematics	**Number**	**Percentage**
Number of majors classified as juniors (60-89 hours) in fall 2021	**5**	**100**
Number and percentage graduated in that major during 21-22 academic year	1	20
Number and percentage graduated in that major during 22-23 academic year	2	40
Number and percentage that graduated in that major during 23-24 academic year	1	20

Major: Pre-Engineering	**Number**	**Percentage**
Number of majors classified as juniors (60-89 hours) in fall 2021	**2**	**100**
Number and percentage graduated in that major during 21-22 academic year	1	50
Number and percentage graduated in that major during 22-23 academic year	0	0
Number and percentage that graduated in that major during 23-24 academic year	0	0

What do the data indicate regarding strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths:

- Math courses are available in person and online.
- Math faculty are very flexible in their offerings and often teach classes for no pay when a course is needed for a student to graduate.
- 80% of the juniors (all but one student) graduated on time.
- This year, the Math program was viable as it had 4 graduates in one year.

Weaknesses:

- As math is at the top of most people's worst subject list, it is difficult to recruit for math. Most people who major in math always knew that they would. Convincing freshmen to major in it is almost impossible.

Opportunities for Growth:

- With the introduction of the Computer Science degree that is coming soon, hopefully these students can be convinced to double major as the math courses required for the Computer Science degree almost mirror the required courses for the Data Science option.
- Now that the two associate degrees (Data Science and Engineering Mathematics) are active, the hope is that there will be an increase in the number of Math degrees conferred.
- Recruiting more CIS majors to double major in Data Science would be beneficial.
- More advertising in different areas about the online availability of math courses could help to attract students in various places towards the degree.

Threats to Effectiveness:

- The major threat is most people's fear of math. Many people shudder if you even say "calculus".
- Most people are unaware of the career options available to someone with a math degree.

Major: Natural Science	**Number**	**Percentage**
Number of majors classified as juniors (60-89 hours) in fall 2021	**3**	**100**
Number and percentage graduated in that major during 21-22 academic year	1	33
Number and percentage graduated in that major during 22-23 academic year	1	33

Major: Natural Science	Number	Percentage
Number and percentage that graduated in that major during 23-24 academic year	0	0

Major: Allied Health	Number	Percentage
Number of majors classified as juniors (60-89 hours) in fall 2021	**4**	**100**
Number and percentage graduated in that major during 21-22 academic year	1	25
Number and percentage graduated in that major during 22-23 academic year	0	0
Number and percentage that graduated in that major during 23-24 academic year	0	0

What do the data indicate regarding strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths:

- The Natural Sciences degree provides students who start off majoring in biology, chemistry, or the double major a less difficult option so that they can still receive a degree.
- This degree plan has the flexibility needed for Allied Health majors regardless of whether they are on the radiology technician, physical therapy, occupational therapy, dental hygiene, etc.

Weaknesses:

- Most of the students in this degree are in it for financial aid purposes and have no intention of actually earning a degree.
- As most Allied Health programs only require 60 hours or less of coursework for admission, most Natural Science/Allied Health majors leave before their junior year.

Opportunities for Growth:

- Inform students that they can and should transfer hours back to UAM to complete their bachelor's degree.

Threats to Effectiveness:

- There are actually a lot more students in these plans, but most of the time these students are categorized as Associate of Arts students and are never assigned to the School of Math and Sciences.

Gateway Course Success (Applies only to units teaching Gateway Courses: Arts/Humanities, Math/Sciences, Social Behavioral) (Data Source: Institutional Research)

Table 5: Gateway Course Success*

		2021-2022 *Passed		2021-2022 Failed		2022-2023 *Passed		2022-2023 Failed		2023-2024 Passed		2023-2024 Failed		3-Year Trend *Passed		3-Year Trend Failed	
Course	**Remediation**	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Course MATH 1003 Quantitative Literacy	**No Remediation**	100	59	70	41	96	68	45	32	184	58	132	42	380	61	247	39
Course MATH 1103 Quantitative Literacy with Review	**Less than 16 Math ACT**	79	35	145	65	76	33	153	67	50	25	153	75	205	31	451	69
Course MATH 1033 Trigonometry	**No Remediation**	34	60	23	40	42	72	16	28	36	48	39	52	112	59	78	41
Course MATH 1043 College Algebra	**No Remediation**	79	59	54	41	72	61	47	39	68	61	43	39	219	60	144	40
Course MATH 1143 College Algebra with Review	**16-21 Math ACT**	53	83	11	17	74	90	8	10	118	72	45	28	245	79	64	21
Course MATH 2255 Calculus I	**No Remediation**	12	57	9	43	17	55	14	45	15	75	5	25	44	61	28	39

*Passed = A, B, or C; Failed = D, F, or W

What do the data indicate regarding strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths:

- Although there was a drastic increase in the fail rate for College Algebra with Review, it is still one of the most successful gateway math courses at UAM.
- Calculus I had the highest success rate of all the math courses.

Weaknesses:

- With the lowering of the math ACT cutoff scores to enroll in college level math courses, MATH 1003, MATH 1103, and MATH 1143 all saw significant increases in their fail rate. This was expected.
- 3 out of every 4 students that took Quantitative Literacy with Review this year failed the course.

Opportunities for Growth:

- This year, the lab for Quantitative Literacy with Review will be split after the first exam. Those who pass remain in their lab while those who don't will be put into another lab with a different instructor to receive specialized instruction to better aid them for the next exam.
- Further curriculum changes may be underway.
- Increasing Freshman attendance is critical.

Threats to Effectiveness:

- The lowering of the ACT cut off scores to enter college level math courses is a threat to effectiveness as having the larger spread of abilities in the same course makes that course more difficult to teach.
- The biggest obstacle in improving gateway success rates is Freshman attendance. The attendance rate is very low. It is almost impossible for students to pass the course unless they attend class regularly.

Completion (Graduation/Program Viability)

Table 6: Number of Degrees/Credentials Awarded by Program/Major (Data Source: Institutional Research)

Number of Degrees Awarded:

Undergraduate Program/Major	2021-2022	2022-2023	2023-2024	Three-Year Total	Three-Year Average
Biology	11	12	12	35	11.67
Chemistry	7	6	3	16	5.33
Mathematics	3	2	4	9	3
Natural Sciences	5	2	0	7	2.33
Total	26	22	19	67	22.33

Provide an analysis and summary of the data related to Progression/Retention/Program Viability including future plans to promote/maintain program viability.

The number of graduates in Biology is steady with exactly the same number of graduates as the year before. This could mean that the decline seen from 2020-2021 has leveled off and may soon to uptick. The number of Chemistry majors decreased drastically as the Biology/Biochemistry Double Majors have the option to drop one of their degrees. Whenever a degree is dropped, it is always the Biochemistry portion. This was the first year in a while that Mathematics met viability. This could be due to the Data Science degree option. This year, Natural Science had no majors. This degree is filled with either students who struggled in the Biology or Chemistry programs or Allied Health students who never planned to get a degree from UAM.

This year, Associate of Science degrees in Data Science and in Engineering Mathematics became active. The aim is to increase the number of completers in Mathematics. Plans are also being developed for a possible Associate of Applied Science degree in Medical Laboratory Technology which would either be a reorganization of the Biochemistry degree to increase the number of completers in that major or a reorganization of Natural Science for the same reason.

Tracking graduates

Summarize how you track the career progression of your unit's graduates.

Many students keep in touch with faculty to let them know of program acceptances and degrees earned via phone calls, emails, or visits back to campus. Others communicate through social media such as Facebook to inform of career changes or progressions.

Record the number of recent graduates entering jobs related or unrelated to their major or pursing further credentials related or unrelated to their major.

Graduates past three years	**CP:** 0 **TC:** 0 **Assoc:** 0 **Bach:** 67 **GC:** 0 **Master:** 0

	Related to major	**Unrelated to major**	**Unknown**	**Pursuing higher credential**
Graduates past three years entering workforce	**CP:** 0 **TC:** 0 **Assoc:** 0 **Bach:** 4 **GC:** 0 **Master:** 0	**CP:** 0 **TC:** 0 **Assoc:** 0 **Bach:** 1 **GC:** 0 **Master:** 0	**CP:** 0 **TC:** 0 **Assoc:** 0 **Bach:** 23 **GC:** 0 **Master:** 0	**CP: 0** **TC: 0** **Assoc: 0** **Bach:** 39 **GC: 0** **Master: 0**
Salary range **(no data available)**	**CP:** **TC:** **Assoc:** **Bach:** **GC:** **Master:**	**CP:** **TC:** **Assoc:** **Bach:** **GC:** **Master:**		

Faculty

Table 7: Faculty Profile, Teaching Load, and Other Assignments (Data Source: Institutional Research)

				Teaching Load				
Faculty Name	**Status/ Rank**	**Highest Degree**	**Area(s) of Responsibility**	**Summer II**	**Fall**	**Spring**	**Summer I**	**Other Assignments**
Abbott, Richard	Asst. Prof.	Ph.D.	Biology	0/0	15/18	12/15	0/0	Director of the UAM Herbarium
Bacon, Edmond	Instructor/ Prof Emeritus	Ph.D.	Biology	0/0	13/15	17/19	0/0	Director of the Turner Neal Museum
Barton, Laura	Instructor	M.S.	Mathematics	0/0	15/15	15/15	5/5	Director of the ACTM Math Contest
Bramlett, J. Morris	Professor	Ph.D.	Chemistry	6/6	10/12	11/12	0/0	Director of the Pomeroy Planetarium
Burrows, Ross	Assoc. Prof	Ph.D.	Physics	0/0	10/12	13/15	0/0	Director of the SE Arkansas Regional Science Fair
Chappell, Jessie	Lab Instructor (adjunct)	M.S.	Biology	0/0	2/3	2/3	0/0	
Cooper, Lura	Instructor	MAT	Mathematics	6/6	16/16	11/11	6/6	
Ferrer, Arturo Q	Asst. Prof.	Ph.D.	Biology	0/0	12.33/14	12.33/13	0/0	Assistant Director of Research Programs for Minority Students (RPMS)
Fox, Victoria Lynn	Assoc. Prof.	Ph.D.	Mathematics	6/6	12/12	13/13	0/0	Assistant Dean of Mathematics
Gavin, Jared	Assoc. Prof.	Ph.D.	Mathematics and Physics	6/6	12/12	10.33/11	0/3	
Goodding, Alan	Instructor	MAT	Mathematics	0/0	14/14	15/15	0/0	
Grilliot, Matthew	Adjunct Instructor	Ph.D.	Biology	0/0	4.33/5	0/0	0/0	
Hatfield, Susan	Lab Instructor	M.S.	Chemistry	6/6	11.33/14	11.33/14	6/6	Stockroom manager for Intro and General Chemistry
Huang, Jinming	Professor	Ph.D.	Chemistry	0/0	11/12	11/23	5/6	
Hunt, John	Professor	Ph.D.	Biology	6/6	11/12	12/12	0/0	Director of Pre-Medicine Studies
Martin, E. Carole	Assoc. Prof.	Ed.D.	Mathematics	0/0	12/12	11/11	0/0	
Massah, Courtney	Adjunct instructor	M.S.	Biology	3/3	3/3	3/3	3/3	
Morgan, Lauren	Lab Instructor	B.S.	Biology	6/6	10.66/16	11.33/17	3/3	Stockroom manager for Biology
Muhoza,	Asst. Prof.	Ph.D.	Chemistry	0/0	12/12	12/14	0/0	Director of Research Programs for Minority

Faculty Name	Status/ Rank	Highest Degree	Area(s) of Responsibility	Summer II	Fall	Spring	Summer I	Other Assignments
Djamali								Students (RPMS)
Nall, Morgan	Lab instructor (adjunct)	M.S.	Biology	2/3	0/0	0/0	0/0	
Roser, Andrew	Asst. Prof.	Ph.D.	Biology	0/0	12/15	11/12	3/3	
Sayyar, Hassan	Assoc. Prof.	Ph.D.	Mathematics	0/0	12/12	15/15	3/3	
Sayyar, Kelley	Instructor	M.S.	Earth Science	6/6	15.66/19	14.33/17	0/0	
Sims, Christopher	Professor	Ph.D.	Biology	0/0	11/12	13/15	0/0	Asst. Dean for the Sciences
Slater, Shuneize	Asst. Prof.	Ph.D.	Chemistry	0/0	3/3	3/3	0/0	Dean of Math and Sciences
Early College High School								
Bridgforth, Cherie	Adjunct instructor	MAT	Math – White Hall H.S.	0/0	6/6	6/6	0/0	
Cupples, James	Adjunct instructor	M.S.	Math – Parkers Chapel H.S.	0/0	6/6	0/0	0/0	
Ross, Shelvia	Adjunct instructor	MAT	Math – Hamburg H.S.	0/0	14/14	9/9	0/0	

What significant change, if any, has occurred in faculty during the past academic year?

- Ms. Morgan Nall was not asked to return to her part time position as lab instructor in August 2023 due to enrollment.
- Dr. Matthew Grilliot no longer adjuncts for the department as of December 2023.
- Dr. Edmond Bacon officially resigned from his position as Instructor of Biology in May 2024 and as Director of the Turner Neal Museum.
- Dr. Christopher Sims officially resigned from his position as Professor of Biology and as Assistant Dean of Science in June 2024.
- Dr. John Hunt gained the position of Assistant Dean of Science upon Dr. Sims's resignation.

Table 8: Total Unit SSCH Production by Academic Year (ten year) (Data Source: Institutional Research)

Academic Year	Total SSCH Production	Percentage Change	Comment
2014-15	15550	+14.8%	Not including 1403 concurrent enrollment
2015-16	14696	-5.42%	Not including 1430 concurrent enrollment
2016-17	13841	-5.82%	Not including 1729 concurrent enrollment
2017-18	14421	+4.19%	Not including 1296 concurrent enrollment
2018-19	11915	-17.4%	Not including 554 concurrent enrollment
2019-20	10402	-13.7%	Not including 381 concurrent enrollment
2020-21	9393	-9.7%	Not including 369 concurrent enrollment
2021-22	8575	-8.7%	Not including 384 concurrent enrollment
2022-23	8346	-2.7%	Not including 425 concurrent enrollment
2023-24	8435	+1.1%	Not including 607 concurrent enrollment

What significant change, if any, has occurred in unit SSCH during the past academic year and what might have impacted any change?

This is the first year since the 2017-2018 academic year that Math and Sciences experienced a positive percent change from the last academic year. The increase in SSCHs is demonstrative of the increase in enrollment that the university experienced as a whole.

Unit Agreements, MOUs, MOAs, Partnerships

Table 9: Unit Agreements-MOUs, MOAs, Partnerships, Etc.

Unit	Partner/Type	Purpose	Date	Length of Agreement	Date Renewed
Math and Sciences	Arkansas Dept of Health	Zoonotic Tick Disease Research	Feb 1, 2024	5 months	January 29, 2024

List/briefly describe notable faculty recognition, achievements/awards, service activities and/or scholarly activity during the past academic year.

Faculty Scholarly Activity

Publications:

Majure, L.C., R.F.C. Naczi, **J.R. Abbott**, K.R. Wood, J.E. Valencia-D., G. Stonehouse, & K.M. Neubig. Phylogeny of North American Dichanthelium (Panicoideae, Poaceae): testing species limits in one of the most taxonomically complicated group of grasses. International Journal of Plant Sciences. [Submitted.]

Abbott, J.R. Iridaceae, the Iris Family. In: New Manual of Vascular Plants of Northeastern United States and Adjacent Canada, online edition. NYBG Press, NY. [Accepted a while back; still awaiting the official publication date.]

Hanes, M.M., O.J. Blanchard, Jr., J.E. Valencia-D., T. McLay, **J.R. Abbott**, S. McDaniel, R.L. Barrett, S. Mathews, & K.M. Neubig. Accepted. Phylogenetic relationship within tribe Hibisceae (Malvaceae) reveal complex patterns of polyphyly in Hibiscus and Pavonia. American Journal of Botany. [Accepted.]

McCartha, G.L., C.M. Sims, B.J. Kosnik, **J.R. Abbott**, M.L. Jones, B.E. Benton, S.A. Mangan, & T.D. Marsico. 2023. Flora of six lower Mississippi River Islands (U.S.A.). JBRIT 17: 281–311.

Pastore, J.F.B., A. Martinez, **J.R. Abbott**, & K.M. Neubig. 2023. Towards new generic delimitations in Polygalaceae II: Senega Spach. Annals of the Missouri Botanical Garden 108: 126–249.

Ganeshaiah, K.N., K.N. Gandhi, B.R. Kailash, R. Ganesan, **J.R. Abbott**, K.S. Bawa, P.H. Raven. 2022. Checklist of Indian Plants, Vol. 1–5 [of 13 planned]. Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore. -- while this has a 2022 date, it was only made available in print in 2023. See the attached ATREE writeup on the checklist, as well as the UAM NEWS RELEASE_Abbott file.

Tran LT, Green KJ, Rodriguez-Rodriguez M, Orellana GE, Funke CN, Nikolaeva OV, **Quintero-Ferrer A**, Chikh-Ali M, Woodell L, Olsen N, Karasev AV. Prevalence of Recombinant Strains of Potato Virus Y in Seed Potato Planted in Idaho and Washington States Between 2011 and 2021. Plant Dis. 2022 Mar;106(3):810-817. doi: 10.1094/PDIS-08-21- 1852-SR. Epub 2022 Mar 7. PMID: 34698520.

Massey, C., Gray, R., Baldwin, D., **Fox V**., Longing, J., and Salloukh, M. (2023) Selected demographic characteristics and attitudes toward coaching certification of Arkansas varsity high school head coaches. Applied Research in Coaching and Athletics Annual.

Hunt, J. L., M. E. Grilliot, T. L. Best, F. A. Johnson, T. L. Kilgore, and C. M. Wilkerson. 2022. Energy content of seeds of switchgrass (*Panicum virgatum*) in the diet of mourning doves (*Zenaida macroura*) in southeastern New Mexico. *Journal of the Arkansas Academy of*

Science 76:38-41.

Hunt, J. L., M. E. Grilliot, T. L. Best, C. M. Wilkerson, and A. F. Huitt. *In Press.* Energy content of grasshoppers (Orthoptera: Acrididae) in the diet of scaled quail (*Callipepla squamata*) in southeastern New Mexico. *Journal of the Arkansas Academy of Science.*

Hunt, J. L., and T. L. Best. 2023. Seven-year study of foods of mourning doves (*Zenaida macroura*) in southeastern New Mexico. *Southwestern Naturalist* 62:72-77.

Hunt, J. L., M. E. Grilliot, T. L. Best, C. M. Wilkerson, and A. F. Huitt. *In Press.* Energy content of grasshoppers (Orthoptera: Acrididae) in the diet of scaled quail (*Callipepla squamata*) in southeastern New Mexico. *Journal of the Arkansas Academy of Science.*

Hunt, J. L. 2023. Birds and us: a 12,000-year history from cave art to conservation, by Tim Birkhead (review). *Choice* 60-2893.

Hunt, J. L. 2023. Rereading Darwin's Origin of Species: the hesitations of an evolutionist, by Richard G. Delisle and James Tierney (review). *Choice* 60:1689.

Best, T. L., and **J. L. Hunt**. *In preparation.* Mammals of the Southwestern United States. The final draft of the manuscript for this book has been completed. Range maps and skull photos have been prepared. A tentative agreement for publication was reached with the University of Oklahoma Press.

Okoto, P.S., Sonniala, S., Sakhel, B., **Muhoza, D**., Adams, P., Kumar, T.K.S. (2023). A Simple Purification Method for Heat-Stable Recombinant Low Molecular Weight Proteins and Peptides Via GST-Fusion Products. In: Sousa, Â., Passarinha, L. (eds) Advanced Methods in Structural Biology. Methods in Molecular Biology, vol 2652. Humana, New York, NY. https://doi.org/10.1007/978-1-0716-3147-8_8

Lauren, VanDee, Teague Alyssa, East Taylor, Jacinto Kim Rhona, Carter Macie, Totty Jacey, D. Adams Paul, & **Muhoza Djamali**. (2023). 'A Cost-Effective Enzyme Kinetics and Inhibition Model for Biochemistry Education and Research'. Biochemistry and Molecular Biology Education. Under Review. Manuscript ID BAMBED-23-0134

Muhoza D, Okoto, P.S., Kumar, T.K.S. Adams PD . One Step Purification of an Active PAK1 Derived Peptide. Submitted to Protein Expression and Purification. Submitted to Protein Expression and Purification.

International Conference on Immunology, Drug Delivery and Public Health (ICIDP2023). **Andrew Roser**. December 2nd, 2023.

Presentations:

Mota, M.C. de A., J.F.B. Pastore, & **J.R. Abbott**. 2023. Taxonomic Revision of Asemeia (Polygalaceae). 73º Congresso Nacional de Botânica. Belém, Brazil.

Mota, M.C. de A., J.F.B. Pastore, & **J.R. Abbott**. 2023. Phylogeny of Asemeia (Polygalaceae): insights on the chaos. 73º Congresso Nacional

de Botânica. Belém, Brazil.

Hanes, M.M., O.J. Blanchard Jr., J.E. Valencia-D., T. McLay, **J.R. Abbott**, S. McDaniel, R.L. Barrett, S. Mathews, & K.M. Neubig. 2023. A new phylogeny of tribe Hibisceae (Malvaceae) reveals complex patterns of polyphyly in Hibiscus and Pavonia. Botanical Society of America, Boise, Idaho [July 2023].

Arkansas Native Plant Society 2023. Introduction to Plant Phylogeny - Understanding Cladograms, Part 1: Terminology & Concepts, 17 Jun; Introduction to Plant Phylogeny - Understanding Cladograms, Part 2: Examples, 24 Jun. **J.R. Abbott**. https://www.youtube.com/watch?v=_Orv0nu0UmI, https://www.youtube.com/watch?v=Kg9hf0WY1Bk

An Introduction to Vegetative Morphology for Practical Plant ID. **J.R. Abbott**. Illinois Native Plant Society, 17 Jan 2023.

55th Annual Idaho potato conference Pocatello Idaho. **Quintero-Ferrer, A**. Presenter at the spanish session. “Uso de herramientas moleculares para el diagnostico de papa”.

Popular Culture Association of America: **Quintero-Ferrer, A**. Presenter. “Teaching science using comics as an active and passive learning tool”.

Tedex Monticello Presenter. “Your genes don’t tell the whole story”. **Quintero-Ferrer, A**.

Virtually presented at the Chemical Society of Guadalajara. “Establecimiento in vitro y Micropropagacion de Agave Tequilana Weber. **Quintero-Ferrer, A**.

Hunt, J. L., M. E. Grilliot, T. L. Best, C. M. Wilkerson, and A. F. Huitt. Energy content of grasshoppers (Orthoptera: Acrididae) in the diet of scaled quail (*Callipepla squamata*) in southeastern New Mexico. Arkansas Academy of Science, Pine Bluff, Arkansas, March 30-April 1, 2023. Poster Presentation.

Notable Faculty or Faculty/Service Projects

- Dr. J. Richard Abbott is the UAM Herbarium director. He has created a living teaching area to give his students hands-on experience in identify plants and plant motifs. He has received adjunct faculty status at Arkansas State University and serves on graduate committees there. He goes into the field with many graduate students from there. He also works with the Arkansas Natural Heritage Commission within the state.

- Dr. Ed Bacon is the director of the Turner Neal Museum and is the president and coordinator for the local Arkansas Game and Fish Stream Team. He is the UAM coordinator for the UAM Gulf Coast Research Lab and director of the Ouachita River

Basin Research Laboratory. He is also fundraising to build a greenhouse on campus. His attempt has resulted in more than $25000 being either received or pledged.

- Ms. Laura Barton is the coordinator for the Regional ACTM Mathematics Contest.
- Dr. Morris Bramlett is the director of the Pomeroy Planetarium and gives planetarium shows to hundreds of students each year. He is also the campus representative to the NASA Arkansas Space Grant Consortium.
- Dr. Ross Burrows is the director of the Southeast Arkansas Regional Science Fair (SEARSF).
- Ms. Lura Cooper is a consultant for the Dumas School District. She is the advisor for the Sigma Zeta National Honor Society and is a national grader for the AP Calculus exam.
- Dr. Lynn Fox is the Assistant Dean of Mathematics.
- Dr. John Hunt is the chair of the Pre-Professional Committee, and he is also the campus representative for the Goldwater Scholarship Program. He is also a member of the Ouachita Mountain Biological Station Board of Governors.
- Dr. Djamali Muhoza is the director for the Research Program.
- Dr. Arturo Ferrer is the assistant director for the Research Program.
- Dr. Andrew Roser is the UAM representative for the Arkansas Tick-Borne Disease Research Consortium.
- Dr. Christopher Sims is the Assistant Dean of Science.
- Dr. Shuneize Slater is the Dean of Mathematical and Natural Sciences.

Faculty Grant Awards

- Dr. Morris Bramlett, $4864.00 Centennial Grant, mini-split for cooling the planetarium
- Dr. Arturo Quintero-Ferrer, $6000.00 Centennial Grant, hydroponics system

- Dr. Arturo Quintero-Ferrer, $1500.00 UAM Academic Research Award
- Dr. Arturo Quintero-Ferrer, part of $43,819.00 INBRE Shared Equipment Grant
- Dr. V. Lynn Fox, $1500.00 UAM Academic Research Award
- Dr. V. Lynn Fox, $4400.13 Centennial Grant, purchase calculators for the classroom
- Dr. Djamali Muhoza, $6286.00 INBRE Manuscript Summer Support
- Dr. Djamali Muhoza, part of $43819.00 INBRE Shared Equipment Grant
- Dr. Andrew Roser, $1500.00 UAM Academic Research Award
- Dr. Andrew Roser, $15,682.00 Arkansas Department of Health, tickborne illnesses and diseases
- Dr. Andrew Roser, part of $43,819.00 INBRE Shared Equipment Grant

Describe any significant changes in the unit, in programs/degrees, during the past academic year.

Two new options for Mathematics, an Associate of Science in Engineering Mathematics and an Associate of Science in Data Science, were approved and became active.

List program/curricular changes made in the past academic year and briefly describe the reasons for the change.

- The pre-requisites for MATH 1103 Quantitative Literacy with Review were changed to allow non-STEM students who would formerly be placed in Introductory Algebra into the course. Curriculum changes were also made to accommodate the lower scoring students.
- The pre-requisites for MATH 1143 College Algebra with Review were changed to allow students who would formerly be placed in Foundations of College Algebra into the course. Curriculum changes were also made to accommodate the lower scoring students.
- The pre-requisites for MATH 1003 Quantitative Literacy were changed to allow students who would formerly be placed in Quantitative Literacy with Review into the course. Curriculum changes were also made to accommodate the lower scoring

students.

- The Special Topics course Quantitative Literacy lab MATH 096V was given an official number of MATH 01180.
- The Special Topics course College Algebra with Review lab MATH 098V was given an official number of MATH 01380.
- MATH 102 Quantitative Literacy with Review lab received a course number change to reflect the fact that is for zero credits. It is now MATH 01280.
- The number of contact hours for BIOL 2091 Principles of Biology II Lab were changed from 2 to 3 to match other Sophomore level labs.
- The description for BIOL 3013 Plants in Our World was changed to make it less intimidating to students.
- The minimum Composite ACT score to take Anatomy and Physiology I was lowered from 22 to 21 following a review of success rates of different ACT scores

Describe unit initiatives/action steps taken in the past academic year to enhance teaching/learning and student engagement.

- The Math Tutoring Lab is being updated. So far, the room has been carpeted, the walls painted UAM green, and the ceiling painted white. In the near future we hope to update the furniture in the room to create a more welcoming look.
- Embedded tutors were placed in the Quantitative Literacy with Review sections to determine if the presence of the tutor specifically assigned to the course would increase exam grades.
- A classroom set of calculators to be placed in the Quantitative Literacy with Review classrooms were purchased as many students do not bother to bring their calculators to class until exam day but haven't practiced how to use the calculator before the exam.
- 48 TI-84 Plus calculators were purchased and will be placed in the library for students to rent as many students cannot afford graphing calculators.
- The Genetics lab is continuing its transformation into a plant tissue culture lab. To aid in this, a 180-slot hydroponics system was purchased.

- More models were replaced in the Anatomy and Physiology lab as many of our older models were missing pieces.

Other Unit Student Success Data

Include any additional information pertinent to this report. Please avoid using student information that is prohibited by FERPA.

Students who were accepted into programs in 2023-2024 without completing a degree.

Student	Degree Conferred	Academic Plan #1	Academic Plan #2	Placement
1		Chemistry		UAMS Pharmacy School
2		Natural Science	Allied Health	UAMS Radiologic Imaging
3		Natural Science	Allied Health	Dental Hygiene at Mississippi Delta Community College

Assessment Report for Introduction to Biological Sciences, Spring 2024,
University of Arkansas at Monticello, John L. Hunt, Instructor.

On the first class day of the Spring 2024 semester, a pre-test was administered to the students in the Introduction to Biological Sciences classes taught by John Hunt at the University of Arkansas at Monticello. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Biology. The questions were a mix of "big-concept" and detail ideas, and concerned facts that a student who has completed the course would be expected to know, but that wouldn't necessarily be familiar to a student who hasn't had the class. The questions were multiple choice questions with a correct answer and four distractors. (A copy of the questions is included at the end of this report.) On the last day of each class, the students were given the same questions. Students at the beginning of the course were not made aware that they would be assessed in this manner.

Only students who completed both the pre-test and post-test are included in the results given here. Average score on the pre-test was 7.9 out of 15, or 52.7% (n = 25, range 3-12, standard deviation 2.24). Average score on the post-test was 10.6, or 70.4% (n = 25, range 7-14, standard deviation 2.12). Of those who took both pre-test and post-test, 21 registered an improvement on the post-test (n = 25, average increase 2.7 questions, range -2-6, standard deviation 2.02). Average percentage change in score was 42.3% (n = 25, range -12.5-150.0%, standard deviation 40.7%). Two students actually did worse on the post-test than on the pre-test, and two registered no change.

In Spring 2023, several changes were made to the way the class was presented. A chapter on Critical Thinking was added at the beginning of the course. Numerous homework assignments intended to increase student engagement were given during the semester, and quizzes, which had previously been based on lecture material from the previous class day, were changed so that they covered homework assignments, and were given immediately after homework was turned in. Spring 2024 was only the second semester that these changes were implemented in the Intro Biology class, and the results were almost exactly the same as in Spring 2023, and appreciably better than those for Fall 2022. Increases in average test scores and in the results of this assessment protocol seem to indicate that the extra engagement had the desired effect. These attempts to increase engagement will be continued and expanded in future sessions.

This is the tenth year that this type of assessment has been used in the Introduction to Biological Science class. Results seem to indicate that many of the objectives of the class are being met. Questions used for both the pre-test and post-test are included on the next page.

1. Which of the following is NOT one of the basic types of organic molecules found in living things?
    a. Carbohydrates
    b. Proteins
    c. Salts
    d. Nucleic acids
    e. Lipids

2. The primary difference between prokaryotic and eukaryotic cells is that prokaryotic cells do not contain membrane-bound structures called:
    a. Cilia
    b. Chromosomes
    c. Organelles
    d. Ribosomes
    e. Sutures

3. Which of the following is the BEST definition of the word “gene?”
    a. Physical trait exhibited by an organism.
    b. Section of DNA molecule that contains instructions for building a protein.
    c. Part of the cell membrane that causes specific behavior.
    d. Sperm cell or egg cell; a gamete.
    e. All of the chromosomes found in a given individual.

4. The aerobic process of breaking down organic molecules such as glucose to build ATP is called:
    a. Photosynthesis
    b. Translation
    c. Methylation
    d. Digestion
    e. Cellular respiration

5. Which of the following is the best definition of a scientific theory?
    a. A law which can be stated mathematically
    b. An explanation for observations which has a good deal of evidence to support it
    c. An educated guess
    d. An observation of natural phenomena
    e. A statement of things that are unknown

6. Proteins are complex molecules made of subunits called:

a. Hydrocarbons
b. Amino acids
c. Sugars
d. Nucleotides
e. Fatty acids

7. Spontaneous movement of molecules from an area of higher concentration to an area of lower concentration is called:
    a. Crenation
    b. Brownian motion
    c. Reduction
    d. Diffusion
    e. Concentration dispersal

8. All of the living organisms interacting within a specific area make up a:
    a. Population
    b. Community
    c. Ecosystem
    d. Species
    e. Biome

9. "A change in allele frequencies between generations" is a simple definition of:
    a. Mutation
    b. Speciation
    c. Evolution
    d. Fitness
    e. Stabilizing selection

10. Which of these terms ***best*** describes the overall structure of DNA?
    a. phospholipid bilayer
    b. helix
    c. double helix
    d. triple helix
    e. modified polypeptide chain

11. Where do plants get carbon that they make into organic molecules?
    a. From groundwater absorbed by roots
    b. Symbiotic fungi
    c. The sun
    d. Carbon dioxide from the atmosphere
    e. Other organisms

12. In animals, meiosis occurs to produce:
    a. Somatic cells
    b. Clones
    c. Diploid cells
    d. Red blood cells
    e. Gametes

13. Which of the following is a byproduct of photosynthesis?
    a. Carbon dioxide
    b. Glucose
    c. Riboflavin
    d. Oxygen
    e. Nitrogen gas

14. Why does your body need oxygen?
    a. DNA molecules don't break down properly without oxygen
    b. Kidneys use oxygen to construct molecules of urine
    c. Oxygen is necessary to get rid of carbon dioxide
    d. Oxygen allows cells to get more usable energy from organic molecules
    e. Lack of oxygen allows anti-oxidants to trigger apoptosis (cell death).

15. A true-breeding plant that produces red flowers is crossed with a true-breeding plant that produces white flowers. All of the flowers of all of the offspring are red. The best explanation for this is:
    a. the red allele is recessive to the white allele
    b. all of the offspring are homozygous red
    c. the red allele is dominant to the white allele
    d. the alleles are codominant
    e. red is an easier color to produce

Assessment Report for Evolution, Spring 2024, University of Arkansas at Monticello, John L. Hunt, Instructor.

On the first class day of the Spring 2024 semester, a pre-test was administered to the students in the Evolution class at the University of Arkansas at Monticello. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Evolution. The questions were a mix of "big-concept" and detailed ideas, and concerned facts that a student who has completed the course would be expected to know, but that wouldn't necessarily be familiar to a student who hasn't had the class. The questions were multiple choice questions with a correct answer and four distractors. (A copy of the questions is included at the end of this report.) On the last day of class, the students were given the same questions. Students at the beginning of the course were not made aware that they would be assessed in this manner.

Only students who completed both the pre-test and post-test are included in the results given here. Average score on the pre-test was 5.3 out of 15, or 35.3% (n = 10, range 4-9, standard deviation 1.64). Average score on the post-test was 9.9 out of 15, or 66.0% (n = 10, range 6-13, standard deviation 2.03). All of the students registered an improvement on the post-test (n = 10, average increase 4.6 questions, range 2-9, standard deviation 2.07). Average percentage change in score was 97.3% (n = 10, range 28.6-225.0%, standard deviation 57.8%).

This is the tenth year that this type of assessment has been used in the Evolution class. (No assessment was conducted in 2020 due to the Covid-19 pandemic). Results seem to indicate that many of the objectives of the class are being met. This year's results were roughly the same as in 2023, and the differences are small, and probably not statistically significant, especially considering small class sizes both years. Questions used for both the pre-test and post-test are included below.

1. Which of the following is the best definition of "evolution?"
    a. Adaptation to environmental change.
    b. Selection of the best traits.
    c. Change in gene frequency between generations.
    d. Change over time.
    e. Mutation of genes into new alleles.

2. The most critical factor in the evolution of new species is:
    a. Large amounts of inbreeding
    b. High heterozygosity
    c. Sexual dimorphism
    d. Reproductive isolation
    e. Low genetic diversity.

3. Which of the following is ***most*** compatible with the idea of evolution through natural selection?
    a. Chain of Being
    b. Fixity of species
    c. Mutability of species

d. Special creation
e. Theory of Acquired Characteristics

4. Which of the following concepts is crucial to building phylogenies?
    a. Analogous structures
    b. Sympatry
    c. Allopatry
    d. Convergent evolution
    e. Parsimony

5. “Any non-random force which causes differential reproductive success of organisms with different genetic traits” is a good definition of:
    a. Evolution
    b. Adaptation
    c. Selection
    d. Fitness
    e. Mutation

6. Which of the following is the best description of the function of HOX genes:
    a. Providing variation for the immune system.
    b. Allowing an increase in hair coloration.
    c. Control of morphogenesis.
    d. Increasing fecundity.
    e. Reduction of mutations.

7. The Hardy-Weinberg Law describes:
    a. Sexual selection possibilities.
    b. How recessive mutations are maintained in a population.
    c. The speed with which new species are formed.
    d. Equilibrium of allele frequencies in a population.
    e. Formation of biogeographical regions.

8. The Hamilton-Zuk hypothesis relates sexual selection to:
    a. Number of body segments.
    b. Size of genitalia.
    c. Number of offspring.

d. Parasite load.
e. Feather color.

9. At what level does natural selection act most strongly?
    a. Gene
    b. Cell
    c. Species
    d. Family
    e. Genus

10. Which of the following taxonomic groups contains organisms that are probably most similar to the first organisms to arise on earth?
    a. Archaea
    b. Eubacteria
    c. Protista
    d. Eucarya
    e. Fungi

11. What is another word that means exactly the same thing as "type specimen?"
    a. Paratype
    b. Holotype
    c. Topotype
    d. Allotype
    e. Neotype

12. Which of the following is NOT a real proposed hypothesis that attempts to explain the disappearance of the dinosaurs?
    a. Terminal Constipation Hypothesis
    b. Arctic Spillover Hypothesis
    c. Death Star Hypothesis
    d. Genetic Collapse Hypothesis
    e. Extraterrestrial Impact Hypothesis

13. Cuckoos which lay their eggs in the nest of other birds color their eggs to match those of the host bird. This is a form of:
    a. Mullerian mimicry
    b. Batesian mimicry
    c. Photomimicry

d. Aggressive mimicry
e. Mertensian mimicry

14. Of the following species concepts, which one is most commonly used when discussing sexually reproducing animals?
    a. Ecological
    b. Phenetic
    c. Recognition
    d. Biological
    e. Morphological

15. For natural selection to operate:
    a. members of a population must lack variation
    b. all offspring in a population must survive
    c. advantageous traits must be genetic in nature
    d. there must be an excess of available resources
    e. there must be no competition between individuals.

Assessment Report for Comparative Anatomy, Fall 2023, University of Arkansas at Monticello, John L. Hunt, Instructor.

On the first class day of the Fall 2023 semester, a pre-test was administered to the students in the Comparative Anatomy class at the University of Arkansas at Monticello. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Comparative Anatomy. The questions were a mix of "big-concept" and detail ideas, and concerned facts that a student who has completed the course would be expected to know, but that wouldn't necessarily be familiar to a student who hasn't had the class. The questions were multiple choice questions with a correct answer and four distractors. (A copy of the questions is included at the end of this report.) On the last day of class, the students were given the same questions. Students at the beginning of the course were not made aware that they would be assessed in this manner.

Only students who completed both the pre-test and post-test are included in the results given here. Average score on the pre-test was 4.7 out of 15, or 31.3% (n = 6, range 2-7, standard deviation 1.97). Average score on the post-test was 11.0, or 73.3% (n = 6, range 8-13, standard deviation 2.10). All students in the class registered an improvement on the post-test (n = 6, average increase 6.3 questions, range 5-9, standard deviation 1.37). Average percentage change in score was 165.7% (n = 6, range 83.3-300.0%, standard deviation 89.7%).

This is the ninth year that this type of assessment has been used in the Comparative Anatomy class, although classes in 2019 and 2020 were not assessed due to the pandemic. Results in 2023 were better than to those obtained in the preceding years, but this is probably due to the fact that the class was the smallest one in years, and consisted almost completely of the very best of our students. Results seem to indicate that many of the objectives of the class are being met. The instructor will use the assessment again next year.

Questions used for both the pre-test and post-test are included below.

1. Which of the terms below describes similarities due to convergent evolution?
a. Homoplasy
b. Homology
c. Analogy
d. Pleiotropy
e. Anamorphy

2. Which of the following terms refers to a group that you don't belong to?
a. Tetrapoda
b. Chordata
c. Eutheria
d. Archosauria
e. Amniota

3. The process of induction is an important part of which of the following?
a. Evolution
b. Development
c. Respiration
d. Digestion
e. Muscle function

4. Vertebrate jaws originally evolved from:
a. Dermal bones
b. Cervical vertebrae
c. Cranial bones
d. Gill arches
e. Fin rays

5. Zygapophyses are projections found on:
a. Inner wall of the digestive tract
b. Jawbones
c. Fins

d. Vertebrae
e. Tongue

6. Which one of the following structures is the evolutionary ancestor of the human forearm:
a. Lobed fin
b. Ray fin
c. Procoracoid
d. Gill arch
e. Interclavicle

7. Hypobranchial and branchiomeric musculature is associated with:
a. Lungs
b. Limbs
c. Veterbral column
d. Eyeballs
e. Jaws

8. From an evolutionary standpoint, most fishes and tetrapods started out with a specific number of aortic arches. That number is:
a. Four
b. Five
c. Six
d. Eight
e. Twelve

9. One of the following organs does not develop embryologically from the digestive system. Which is it?
a. Lung
b. Liver
c. Intestine
d. Stomach
e. Kidney

10. Pronephric, mesonephric, and metanephric are different types of:
a. Kidney
b. Lung
c. Liver

d. Brain
e. Vertebrae

11. In which type of animal is the male reproductive system most closely related to the excretory system?
a. Kangaroo
b. Red-winged blackbird
c. Perch
d. King snake
e. African elephant

12. Another name for the telencephalon is:
a. Olfactory nerve
b. Cerebrum
c. Pancreas
d. Cranium
e. Mandible

13. The sclera, ciliary body, and suspensory ligament are structures associated with:
a. Esophagus
b. Pancreas
c. Brain stem
d. Spinal cord
e. Eye

14. Mammals have a four-chambered heart with two atria and two ventricles. Which of the following animals also has such a heart?
a. Lungfish
b. Bull shark
c. Musk turtle
d. American alligator
e. Iguana

15. The part of the skull which originates with structures associated with the gills of early vertebrates is called:
a. Splanchnocranium
b. Dermatocranium
c. Neurocranium

d. Chondrocranium
e. Glossocranium

Assessment Report for Mammalogy, Fall 2023, University of Arkansas at Monticello, John L. Hunt, Instructor.

On the first class day of the Fall 2023 semester, a pre-test was administered to the students in the Mammalogy class at the University of Arkansas at Monticello. The pre-test consisted of 15 questions designed to test the students' prior knowledge of some of the most important concepts of Mammalogy. The questions were a mix of "big-concept" and detail ideas, and concerned facts that a student who has completed the course would be expected to know, but that wouldn't necessarily be familiar to a student who hasn't had the class. The questions were multiple choice questions with a correct answer and four distractors. (A copy of the questions is included at the end of this report.) On the last day of class, the students were given the same questions. Students at the beginning of the course were not made aware that they would be assessed in this manner.

Only students who completed both the pre-test and post-test are included in the results given here. Average score on the pre-test was 5.2 out of 15, or 34.7% (n = 10, range 1-11, standard deviation 2.97). Average score on the post-test was 8.4, or 56.0% (n = 10, range 4-13, standard deviation 2.41). Eight of the 10 students in the class registered an improvement on the post-test (n = 10, average increase 3.2 questions, range 0-8, standard deviation 2.70). Average percentage change in score was 140.9% (n = 10, range 0.0-800.0%, standard deviation 241.0%). Two students scored the same on the post-test as on the pre-test.

This is type of assessment has been used in the Mammalogy class since 2013. Results seem to indicate that many of the objectives of the class are being met. The instructor will use the assessment again next year. The instructor will analyze results of individual questions to determine whether changes in the presentation of material need to be made to make sure that all concepts are being covered adequately.

Questions used for both the pre-test and post-test are included below.

1. Which of the following structures is the best way to determine whether or not a fossil animal is a mammal?
    a. Hair
    b. Mammary gland
    c. Tail vertebrae
    d. Jaw articulation
    e. Neck vertebrae

2. From an evolutionary standpoint, which of the following animals is more closely related to a walrus?
    a. Manatee
    b. Dolphin
    c. Bobcat
    d. Killer whale
    e. Spider monkey

3. Which of the following is most common among mammals?

a. Polygyny
b. Monogamy
c. Polyandry
d. Promiscuity
e. Asexual reproduction

4. Flying mammals are included in which of the following orders?
    a. Cetacea
    b. Soricomorpha
    c. Cingulata
    d. Chiroptera
    e. Didelphimorphia

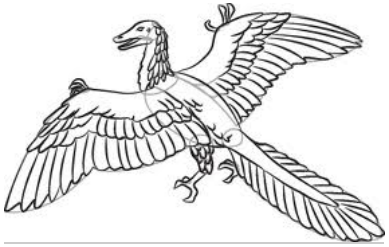
5. The greatest diversity among marsupials is found in Australia and:
    a. Europe
    b. North America
    c. South America
    d. Africa
    e. Asia

6. The functional unit of the mammalian kidney is called:
    a. Ureter
    b. Loop of Henle
    c. Bowman's Capsule
    d. Medulla
    e. Nephron

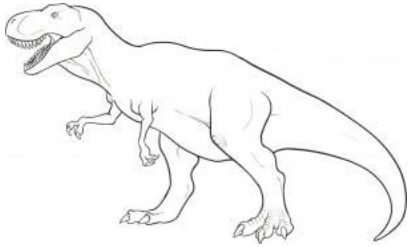
7. Which of the following does not belong with the others?
    a. Wombat
    b. Kangaroo
    c. Platypus
    d. Numbat
    e. Thylacine

8. Which of the following is not a characteristic of all mammals?
    a. Bicornate uterus
    b. Mammary glands
    c. Endothermy
    d. Dentary-squamosal articulation
    e. Non-nucleated red blood cell

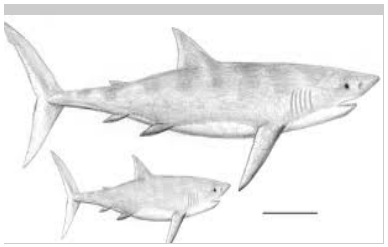
9. Which of the animals pictured below is most like the common ancestor to all mammals?



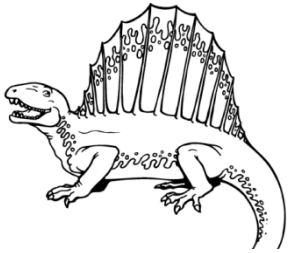
a. *Archaeopteryx*



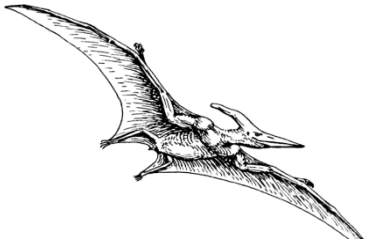
b. *Tyrannosaurus*



c. *Megalodon*



d. *Dimetrodon*



e. *Quetzalcoatlus*

10. Which of the following animals would NOT be considered myrmecophagus?
    a. Giant anteater
    b. Aardvark
    c. Three-toed sloth
    d. Pangolin
    e. Echidna

11. How many temporal fenestra (openings in the side of the skull) do mammals have?
    a. None

b. One
c. Two
d. Three
e. Four

12. The cutting teeth found in the jaws of carnivores are called:
    a. Bundodont
    b. Carnassials
    c. Hypsodont
    d. Canines
    e. Homodont

13. Many mammals are endangered, threatened, or have declining populations. Which of the following is the MOST important reason for this?
    a. Environmental pollutants
    b. Introduced competitors
    c. Introduction of exotic diseases
    d. Destruction of habitat
    e. Overhunting

14. Approximately what percentage of all mammal species belong to Order Rodentia?
    a. 10 %
    b. 20 %
    c. 40 %
    d. 70 %
    e. 80 %

15. Which was the first mammal to be domesticated?
    a. Dog
    b. Cat
    c. Horse
    d. Cow
    e. Goat

Addenda

Addendum 1: UAM Vision, Mission, and Strategic Plan

VISION

The University of Arkansas at Monticello will be recognized as a model open access regional institution dedicated to empowering students to realize and develop their potential. UAM is committed to advancing three vibrant, diverse campuses that serve their communities and foster key partnerships that contribute to the economy and quality of life in the region, state, and beyond.

MISSION

The University of Arkansas at Monticello is a society of learners committed to individual achievement by:

- Fostering a quality, comprehensive, and seamless education for diverse learners to succeed in a global environment;

- Serving the communities of Arkansas and beyond to improve the quality of life as well as generate, enrich, and sustain economic development;

- Promoting innovative leadership, scholarship, and research which will provide for entrepreneurial endeavors and service learning opportunities;

- Creating a synergistic culture of safety, collegiality, and productivity which engages a diverse community of learners.

CORE VALUES:

- *Ethic of Care*: We care for those in our UAM community from a holistic perspective by supporting them in times of need and engaging them in ways that inspire and mentor.

- *Professionalism*: We promote personal integrity, a culture of servant leadership responsive to individuals' needs as well as responsible stewardship of resources.

- *Collaboration*: We foster a collegial culture that encourages open communication, cooperation, leadership, and teamwork, as well as shared responsibility.

- *Evidence-based Decision Making*: We improve practices and foster innovation through assessment, research, and evaluation for continuous improvement.

- *Diversity*: We embrace difference by cultivating inclusiveness and respect of both people and points of view and by promoting not only tolerance and acceptance, but also support and advocacy.

UAM STUDENT LEARNING OUTCOMES:

- *Communication:* Students will communicate effectively in social, academic, and professional contexts using a variety of means, including written, oral, quantitative, and/or visual modes as appropriate to topic, audience, and discipline.

- *Critical Thinking:* Students will demonstrate critical thinking in evaluating all forms of persuasion and/or ideas, in formulating innovative strategies, and in solving problems.

- *Global Learning:* Students will demonstrate sensitivity to and understanding of diversity issues pertaining to race, ethnicity, and gender and will be capable of anticipating how their actions affect campus, local, and global communities.

- *Teamwork:* Students will work collaboratively to reach a common goal and will demonstrate the characteristics of productive citizens.

STRATEGIC PLAN

Goal 1: Promote Opportunity and Success for All Students

Outcome 1.1: Exemplify a student-centered culture.

Strategy 1.1.1: Promote effective communication, marketing, and business practices that underscore our student-centered culture and thereby enhance recruitment and retention.

Strategy 1.1.2: Assess current student support structures to identify gaps in service or deterrents.

Strategy 1.1.3: Implement new curricular and co-curricular activities to enhance the overall student experience.

Strategy 1.1.4: Broaden student knowledge of and access to resources that promote mental health, physical health, and safety.

Strategy 1.1.5: Streamline admission, enrollment, and financial processes.

KPI: *Year-to-year student enrollment*

KPI: *Fall-to-spring, fall-to-fall student retention rate (excluding completers, graduate students and concurrent students)*
KPI: *Year-to-year number of students participating in curricular and co-curricular activities*
KPI: *Year-to-year number of students accessing support services*
KPI*: Student satisfaction rate for support services*

Outcome 1.2: Prepare students for success with active learning and personalized engagement opportunities that inspire student creativity, motivate student persistence, and create a desire for life-long learning.

Strategy 1.2.1: Enhance academic advising, tutoring services, and career counseling for all students, especially by establishing a Center for Teaching and Learning.
Strategy 1.2.2: Further promote the academic success of student-athletes, band, choir, residential, international, non-traditional, military veterans and first-generation students.
Strategy 1.2.3: Establish new high-impact student experiences, such as internships, field experiences, job shadowing opportunities, and study abroad.
Strategy 1.2.4: Develop a system of connecting students to service-learning opportunities specific to their interest.
Strategy 1.2.5: Implement innovative instructional models, such as hyflex, in more academic programs.
KPI*: Academic standing data*
KPI: *15, 30, 45, 60, and 90-hour progression data*
KPI: *Fall-to-spring, fall-to-fall student retention rate (excluding completers, graduate students and concurrent students)*
KPI: *On-time graduation rate*
KPI*: Number of credentials conferred year-to-year*
KPI: *Employment rates of graduates in fields related to program of study*

Outcome 1.3: Support the transition from high school to postsecondary education to career by developing marketable skills in students and providing access to employment opportunities.

Strategy 1.3.1: Partner with public schools for early career awareness initiatives starting in elementary school, for example by coordinating a Career Fair twice a year on the Monticello, McGehee, and Crossett campuses.
Strategy 1.3.2: Provide more opportunities for students to directly engage with potential employers.
Strategy 1.3.3: Integrate Career Services support in more academic programs by focusing on junior/ senior courses, projects, or capstones.
Strategy 1.3.4: Partner with industry and businesses for more student internships, and practicums throughout the student technical education/college experience.

KPI: *Academic standing data*
KPI: *Fall-to-spring, fall-to-fall student retention rate (excluding completers, graduate students and concurrent students)*
KPI: *Number of senior projects and capstone experiences*
KPI: *Number of student internships and practicums*

Goal 2: Recruit, Empower, and Retain High-Quality Faculty and Staff

Outcome 2.1: Implement a marketing plan that attracts a qualified and diverse pool of faculty and staff.
Strategy 2.1.1: Expand the advertisement of job postings.
Strategy 2.1.2: Provide training on best practices for hiring, from crafting better job descriptions to running more successful search committees.
KPI: *Percentage of faculty receiving "Excellent" or "Exceeds Expectations" on annual faculty evaluations*

Outcome 2.2: Enhance the working environment for all faculty and staff by providing necessary resources.
Strategy 2.2.1: Increase access to professional development workshops and training to help members of the university community improve their skills.
Strategy 2.2.2: Provide technology that supports advancing instructional needs of faculty.
KPI: *Maintenance of a 5-year rotation of technology*
KPI: *Number of training opportunities released via the Workday Learning Center and/or Blackboard*
KPI: *Number of faculty using Center for Teaching and Learning*

Outcome 2.3: Increase retention of faculty and staff.
Strategy 2.3.1: Identify and share opportunities for job advancement with highly skilled faculty and staff.
Strategy 2.3.2: Develop a mentorship program to prepare individuals for successive leadership roles.
Strategy 2.3.3: Study the feasibility of a career ladder system for staff including incentives for higher education attainment.
Strategy 2.3.4: Enhance funding for faculty and staff salaries each year contingent on enrollment and legislative appropriations.
Strategy 2.3.5: Enhance academic and administrative operating budgets as funding allows.

KPI: *Number of promotions among UAM faculty and staff*
KPI: *Average years of employment for faculty*
KPI: *Average years of employment for staff*

Goal 3: Strengthen Institutional Resources

Outcome 3.1: Optimize student recruitment through transformative marketing initiatives.
Strategy 3.1.1: Promote UAM's presence in the region, state, and beyond through more customized, targeted social media and other marketing strategies.
Strategy 3.1.2: Strengthen communication of marketing plans and procedures to faculty, staff, students and the community.
KPI*: Number of admission applications year-to-year*
KPI*: Enrollment of new students year-to-year*

Outcome 3.2: Enhance the conditions and reliability of university infrastructure and equipment.
Strategy 3.2.1: Update the campus master plan with a timeline for new construction and remodeling of campus facilities.
Strategy 3.2.2: Determine requirements for and begin assembling a sufficient, modern vehicle fleet available for university purposes, including academic field trips, sports events, etc.
Strategy 3.2.3: Develop a plan to prioritize replacement of farm and grounds equipment.
KPI: *Maintenance or construction projects accomplished each year*
KPI: *Disposal and replacement of vehicles and large equipment each year according to set criteria: age, performance, anticipated maintenance cost*

Outcome 3.3: Develop partnerships to strengthen institutional, regional and state resources.
Strategy 3.3.1: Expand concurrent enrollment partnerships to meet regional and state workforce demands.
Strategy 3.3.2: Partner with industry to fund the development of new credit and/or noncredit workforce training to meet regional, state and national needs.
Strategy 3.3.3: Partner with other institutions of higher education to offer unique, cutting-edge academic programs.

Strategy 3.3.4: Partner with other institutions of higher education to offer existing, high-need programs to underserved regions of the state.

Strategy 3.3.5: Partner with communities to address the socio-economic, educational and health and wellness challenges.

***KPI**: Number of concurrent enrollment partnerships year-to-year*

***KPI**: Number of industry partners year-to-year*

***KPI**: Number of students enrolled in noncredit workforce training*

***KPI**: Number of academic programs offered with other institutions of higher education year-to-year*

***KPI**: Number of articulation agreements year-to-year*

***KPI:** Number of grants awarded related to addressing socio-economic, educational, and health and wellness challenges.*

Outcome 3.4: Augment operational funding through external efforts.

Strategy 3.4.1: Strengthen efforts to obtain grant funds for all purposes, including student research, faculty research, academic program development, instructional equipment and general institutional needs.

Strategy 3.4.2: Expand alumni engagement and fundraising efforts.

***KPI:** Number of grant applications submitted each year aimed at enhancing UAM's ability to serve its students, staff, and faculty, especially in the areas of student and faculty research, academic program development, and instructional equipment*

***KPI:** Number of social media posts and hits on the alumni page*

***KPI:** Outreach to prospective donors*

Addendum 2: Higher Learning Commission Sample Assessment Questions

1. How are your stated student learning outcomes appropriate to your mission, programs, degrees, students, and other stakeholders? How explicitly do major institutional statements (mission, vision, goals) address student learning?

- How well do the student learning outcomes of programs and majors align with the institutional mission?
- How well do the student learning outcomes of general education and co-curricular activities align with the institutional mission?
- How well do course-based student learning outcomes align with institutional mission and program outcomes?
- How well integrated are assessment practices in courses, services, and co-curricular activities?
- How are the measures of the achievement of student learning outcomes established? How well are they understood?

2. What evidence do you have that students achieve your stated learning outcomes?

- Who actually measures the achievement of student learning outcomes?
- At what points in the curriculum or co-curricular activities are essential institutional (including general education), major, or program outcomes assessed?
- How is evidence of student learning collected?
- How extensive is the collection of evidence?

3. In what ways do you analyze and use evidence of student learning?

- Who analyzes the evidence?
- What is your evidence telling you about student learning?
- What systems are in place to ensure that conclusions are drawn and actions taken on the basis of the analysis of evidence?
- How is evidence of the achievement of student learning outcomes incorporated into institutional planning and budgeting?

4. How do you ensure shared responsibility for student learning and assessment of student learning?

- How well integrated are assessment practices in courses, services, and co-curricular activities?
- Who is responsible for the collection of evidence?
- How cross-functional (i.e., involving instructional faculty, Student Affairs, Institutional
- Research, and/or relevant administrators) are the processes for gathering, analyzing, and using evidence of student learning?
- How are the results of the assessment process communicated to stakeholders inside and outside the institution?

5. How do you evaluate and improve the effectiveness of your efforts to assess and improve student learning?

- What is the quality of the information you have collected telling you about your assessment processes as well as the quality of the evidence?
- How do you know how well your assessment plan is working?

6. In what ways do you inform the public about what students learn—and how well they learn it?

- To what internal stakeholders do you provide information about student learning?
- What is the nature of that information?
- To what external stakeholders do you provide information about student learning?
- What is the nature of that information?

Addendum 3: Arkansas Productivity Funding Metrics

- The productivity funding formula consists of four categories: Effectiveness (80% of formula), Affordability (20% of formula), Adjustments, and Efficiency (+/-2% of formula).

Effectiveness	Affordability	Adjustment	Efficiency
• Credentials • Progression • Transfer Success • Gateway Course Success	• Time to Degree • Credits at Completion	• Research (4-year only)	• Core Expense Ratio • Faculty to Administrator Salary

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