COLORADO MESA
UNIVERSITY

AY 2013 – 2014
Program Review

Biological Sciences

Colorado Mesa University

BIOLOGICAL SCIENCES

Program Review

AY 2013-2014

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Biological Sciences Program Review 2013-2014

1. INTRODUCTION AND PROGRAM OVERVIEW

A. Program Description

The Biology program offers both Associate (A.S.) and Bachelor of Science (B.S.) degrees, as well as a minor in Biology. Within the B.S. degree, there are two concentrations, one in Biology and the other in Secondary Science Education. The A.S. degree is in Liberal Arts, with a Biology emphasis. The department also administers the minor in Forensic Science.

B. History

The Biology program officially began in 1974 as a two-year program with three faculty members. At the time of the last program review in 2006, there were 12 tenured or tenure-track faculty, 3 full-time instructors, and several part-time lecturers teaching between 1 and 4 credit hours per semester. We also had one full-time staff position of Laboratory Coordinator overseeing student workers, handling laboratory preparations, and ordering all laboratory equipment and materials. As of Fall 2013, we still have 12 tenured or tenure-track faculty plus two faculty members who have shifted from tenured to transitional retirement, 4 full-time faculty characterized as "instructor 30" plus one full-time instructor with a split appointment with the Physical and Environmental Science department, and 7 part-time lecturers, 2 of whom are teaching 10+ credit hours per semester. This year, we have a search going for a tenure-track position that will replace one of our transitional retirees. We still have the full-time staff Laboratory Coordinator and will conduct a search for an Assistant Laboratory Coordinator this year, a new position that will include some laboratory teaching. In 2006, nearly 70% of the faculty members were tenured full professors. In 2013, 42% were tenured full professors. We have an increasingly young faculty, with one more retirement and a new replacement anticipated for Fall 2014.

C. Recommendations from the Previous External Review (on CMU assessment website)

The external reviewer found many positives in our department. He found the faculty to be dedicated and well qualified. He noted that we based recent hires on assessment data showing a need for increased coverage of cellular and molecular processes. He also felt that our overall curriculum was adequate, with opportunities for students to conduct research and participate in internship opportunities.

On the negatives, he noted a lack of physical space, especially for undergraduate research. At that time, we had taken over a regular teaching laboratory space in order to add a second lab space dedicated to student research, but the arrangement was not optimal. Students did not have access to the prep room, so they were not able to prepare

and autoclave their own materials for research. All materials had to be gathered by the faculty member, and the faculty member also had to complete any needed autoclaving.

Since our last program review, an expansion of the science facility has given us additional teaching laboratory space to grow our program, as well as a dedicated student research space consisting of 3 laboratories. The research space includes a small prep room allowing students to prepare and autoclave their own materials. The expansion included a new greenhouse facility to replace our outdated and unreliable one. The new greenhouse includes two separate temperature-controlled rooms and supports plant cultivation for both teaching and research purposes. We are currently well-supplied with the facilities and space to grow our program and believe the deficiency noted in the last review has been fully corrected.

On the curriculum side, the external reviewer suggested that some career paths require more chemistry and physics than is required in our degree. Additionally, while independent study and internship opportunities are positives, perhaps the number of credit hours allowed should be limited. His concern was that students might miss important content if the minimum number of Biology credit hours were completed. The suggestion was made to both limit the number of these individualized learning credit hours and perhaps increase the number of chemistry and physics courses. Also noted was a lack of ecology and evolution in our core courses.

We have made changes in our Biology concentration curriculum to address some of these concerns. BIOL 208/208L Fundamentals of Ecology and Evolution has been added, as well as a requirement that students take at least one cell/molecular course. These additions strengthen the core content of our program. We have also recently made a change to exclude Biology topics courses in the Additional Biology section of our program. Such courses may now only be used as upper-level elective credit. While topics courses are a great way to introduce students to a variety of specialized subject matter, they don't necessarily have the same rigor as our established courses. Our established courses now fit into specific components of our Student Learning Objectives for the Biology concentration (curriculum mapping), while topics courses may or may not fulfill those objectives. We want to be sure all students have a solid background from both the core courses and the content courses chosen for the Additional Biology Categories. We are also making an effort to include laboratories that are more investigative and that emphasize the reading of primary literature.

We have also made changes to our Biology Secondary Teaching concentration, working toward meeting the National Council for Accreditation of Teacher Education (NCATE) accreditation standards. Unfortunately, the concentration failed to achieve accreditation, but we are hopeful that the changes we have made will lead to successful accreditation once we generate supporting data. Specifically, a new course has been added to the curriculum, BIOL 385 Nature and Philosophy of Science, which is designed to meet the current needs of future teachers as well as be an interesting elective course for other majors, including Biology concentration majors. In addition, the secondary teaching majors will now take the same capstone course, BIOL 483 Senior Thesis, and take the

same Major Fields Test in Biology as our Biology concentration majors. These are in addition to the teacher licensure exam that they are required to take.

The department is also currently working on fairly radical changes to our Biology concentration curriculum to address the concerns of the external reviewer as well as concerns expressed by students completing our exit survey as graduating seniors (discussed in a later section). We will be proposing that our current generic Biology degree be divided into several specific concentration: 1) General Biology (essentially the same as our current program); 2) Cell, Developmental, and Molecular Biology; 3) Ecology, Evolutionary, and Organismal Biology; and 4) Pre-Health and Biomedical Biology. While individualized advising allowed our current program to meet the needs of a diverse population of Biology majors, specialized concentrations will more clearly communicate specific content requirements. All concentrations will share a common core as well as the capstone course in Senior Thesis.

The external reviewer also noted that, in order to maintain the extensive list of courses in the catalog with our limited number of faculty, a course rotation schedule should be in place. That specific concern has been addressed with a campus-wide two-year planning calendar. While unexpected changes may occur, students are now able to effectively plan their sequence of coursework. The course-planning calendar is updated yearly.

One suggestion by the external reviewer that has not been considered was the suggestion that Environmental Science merge with Biology. Environmental Science is one of the concentrations within the Department of Physical and Environmental Sciences, which is where it belongs. While there is certainly some overlap between Environmental Science and the ecological course content in Biology, we feel the fundamental philosophies of the two programs are much too different to coexist within one department.

D. Program Centrality to CMU's Role and Mission

Institutional Mission Statement

Committed to a personal approach, Colorado Mesa University is a dynamic learning environment that offers abundant opportunities for students and the larger community to grow intellectually, professionally, and personally. By celebrating exceptional teaching, academic excellence, scholarly and creative activities, and by encouraging diversity, critical thinking, and social responsibility, CMU advances the common good of Colorado and beyond.

Statutory Role and Mission

The role and mission of the institution was reenacted in 2010 by the Colorado General Assembly (Colorado Revised Statutes 23-53-101) and amended in 2011 when Mesa State College was renamed Colorado Mesa University:

There is hereby established a university at Grand Junction, to be known as Colorado Mesa University, which shall be a general baccalaureate and graduate institution with selective admission standards. Colorado Mesa University shall offer liberal arts and sciences, professional, and technical degree programs and a limited number of graduate programs. Colorado Mesa University shall also maintain a community college role and mission, including career and technical education programs. Colorado Mesa University shall receive resident credit for two-year course offerings in its commission-approved service area. Colorado Mesa University shall also serve as a regional education provider.

The Biology Program fits in very well with the role and mission of Colorado Mesa University. Our program serves students in the region, from other locations in the state, and from outside the state.

E. Program Support for Other Majors

The Biology program provides two courses in general science education for non-majors, BIOL 101/101L General Human Biology, and BIOL 102/102L Animal and Plant Biodiversity. The BIOL 101/101L is an especially popular choice, and the number of lab sections to accommodate those students has increased to 19 sections per semester, with all sections generally filled to capacity. Our beginning course for Biology majors, BIOL 105/105L Attributes of Living Systems, is also a general education science course and is a popular choice for majors within the Physical and Environmental Sciences department.

The Biology concentration provides support courses for a variety of programs at CMU. In the Health Sciences Department, all of the nursing degrees, as well as the Bachelors of Applied Science in Radiologic Technology, require BIOL 209/209L and 210/210L Human Anatomy and Physiology I and II, as well as BIOL 241 Pathophysiology. BIOL 101/101L General Human Biology is also recommended as a general education choice for these majors. BIOL 250/250L General Microbiology has recently been approved as a general education natural science choice, and it is likely to be a suggested choice in the general education category for the pre-nursing majors.

The Department of Kinesiology offers a variety of concentrations, many of which require BIOL 209/209L and 210/210L Human Anatomy and Physiology I and II. A new Exercise Science concentration also requires the two A & P courses, plus the upper-level BIOL 341/341L General Physiology and BIOL 409/409L Gross and Developmental Human Anatomy (a new human cadaver-based lab course implemented in Fall 2011).

The new Forensic Anthropology minor requires BIOL 209/209L Human Anatomy and Physiology I as well as a new course, BIOL 410/410L Human Osteology (new course in Fall 2013). An additional new course, BIOL 217/217L Forensic Entomology, is a choice for this minor (new course in Fall 2013).

F. Locational Advantage

Colorado Mesa University is the regional provider for higher education in western

Colorado. For the Biology concentration specifically, the surrounding area is an excellent location for field trips that are a part of non-major and major courses. The Grand Junction area is also an excellent location for ecological research, with much of the public lands controlled by the Bureau of Land Management, National Park Service, or Colorado Parks and Wildlife.

G. Unique Characteristics

For an institution of our size, our commitment to support undergraduate research is unique. With the expansion of the science building, including the added research space, we anticipate increased student participation in our research endeavors. The CMU Biology Department is also part of a partnership with the Saccomanno Higher Education Foundation to provide research opportunities through the Saccomanno Internship Program in Biological Research, which is part of St. Mary's Hospital in Grand Junction. The program just completed its third year. Students selected for the internship complete summer research with faculty research mentors and present their research in a public forum in the Fall semester. This year, six student researchers were supported. It is hoped that the program will continue to grow. Discussions are underway to perhaps continue some aspect of the research activities into the academic year.

2. CURRICULUM

A. Program Curriculum

The Biology program curriculum provides a diverse selection of course work well-suited to prepare students for the diverse career opportunities afforded by a Biology degree. In addition to the core courses, students choose from 3 of 4 categories: Category 1, cellular, developmental and molecular; Category 2, organismal; Category 3, anatomical and physiological; and Category 4, ecology, evolution, and systematics.

Since the last program review, several changes have been made to the curriculum to address some deficiencies in evolution, ecology, and molecular biology. BIOL 208/208L Fundamentals of Ecology and Evolution has been added to the core curriculum, and all majors are required to choose from BIOL 302 Cellular Biology, BIOL 341/341L General Physiology, or BIOL 421/421L Plant Physiology. The changes strengthen the Biology core courses.

We also have a degree in secondary teaching. The program has undergone several curricular changes as state requirements have changed. An unusual aspect of licensure in Colorado is that, although students are receiving a Bachelors degree with Biological Sciences as their content area, the state licenses in Science rather than in Biology. As a consequence of science licensure, students must be proficient in biology, chemistry, physics, and earth sciences. Therefore, the degree is somewhat weak in Biology but does give students the skills necessary to pass their licensure exams, as evidenced by the 91% pass rate from 2007 to 2013. (34 students completed the exam and 3 failed.) Recent changes effective Fall 2013 include adding BIOL 483 Senior Thesis to these students'

curriculum to give them a common capstone with the B.S. Biology concentration students, and a new course, BIOL 385 Nature and Philosophy of Science, in order to strengthen the degree. The program recently failed to attain NCATE accreditation, but it is hoped that these changes will improve the outcome in a future submission.

There are also two minors, a minor in Biology and a minor in Forensics, as well as an Associates degree with an emphasis in Biology.

B. Program Currency

We have made several curricular changes to the program in order to provide a broader base of core courses in the program. In Fall 2008, we added BIOL 208/208L Ecology and Evolution to our core courses and added a requirement that at least one of the Additional Biology courses include BIOL 302 Cellular Biology, BIOL 341/341L General Physiology and lab, or BIOL 421/421L Plant Physiology and lab. Both requirements were added to address some deficiencies in the program. While the core courses of BIOL 105/105L Attributes of Living Systems, BIOL 106/106L Principles of Animal Biology, BIOL 107/107L Principles of Plant Biology, and BIOL 301/301L Principles of Genetics give broad coverage of the basics in the field of Biology, students could miss out on a basic understanding of ecology and evolution or a more in-depth look at cell biology and physiology. The inclusion of BIOL 208/208L and at least one cell biology/physiology course gave much-needed balance to our core courses.

We also added BIOL 409/409L Gross and Developmental Human Anatomy in the Fall of 2011, a course that is beneficial to our health science-oriented students and is required for the B.S. in Exercise Science that is offered by the Kinesiology department. Two courses were added in Fall 2013 to support the minor in Forensic Anthropology: BIOL 217/217L Forensic Entomology and lab and BIOL 410/410L Human Osteology and lab.

In Fall 2009, the institution undertook a campus-wide Academic Program Quality Performance and Prioritization effort. (The report can be found on the CMU assessment website.) The Biology program was one of two selected as a Program of Excellence.

One area in which we felt we needed more work was in the area of student advising. Currently, students have wide flexibility in the choices within the Additional Biology Courses of their program. While that flexibility can be valuable in tailoring a program curriculum best suited to the student's individual career goals, students who fail to meet regularly with their advisors may not take the most suitable selection of course work. We are currently reviewing a possible major change to our program in which the single Biology concentration will be split into 3 or 4 concentrations. The proposed concentrations include General Biology; Cell, Developmental, and Molecular Biology; Ecology, Evolutionary, and Organismal Biology; and perhaps a Pre-Health and Biomedical Science concentration. All would share a common core, but the 20 credit hours of the Additional Biology Courses would be taken from a list tailored to each concentration.

Looking ahead at economic indicators, a Biology degree will continue to facilitate careers in a wide variety of areas with continued growth potential. According to the Economic Development and Employer Planning System (EDEPS) projections (http://edeps.org), employment trends indicate a high need for employees with a biological background. Looking at projections for the year 2020 for selected examples, jobs for biological scientists are expected to grow by 6.3%, for biological technicians by 13.5%, for medical scientists by 36.4%, for zoology and wildlife biologists by 7.4%, and for microbiologists by 16.9%. The need for middle school science teachers is also expected to grow by 16.9% by 2020.

C. Program Delivery

Biology courses are offered at the Main campus, at the Montrose campus, and at a group of high schools in the area as part of the Early Scholars program. Courses at the sites other than the main campus are primarily general education courses, such as BIOL 101/101L General Human Biology or BIOL 102/102L Plant and Animal Biodiversity, or are pre-requisite courses for other programs in the Health Sciences and Kinesiology departments, such as BIOL 209/209L and 210/210L Human Anatomy and Physiology I and II and BIOL 241 Pathophysiology. At the time of the last program review, the vast majority of the courses were site-based and located on the Main campus. In Fall 2006, 13% of our students took a distance learning course. In recent years, the number of students using distance learning coursework has increased to 20-30% (Appendix A, MFT Departmental Demographic Summary).

3. ANALYSIS OF STUDENT DEMAND AND SUCCESS

A. Number of Majors

The number of Biology majors in 2008 was 276. In 2012, there were 457 majors, representing an increase of 181 students. For teacher education, the number of majors has held steady at about 20 majors. The number of students with a minor in Biology has increased from 10 in 2008 to 15 in 2012. The number of students in the forensics minor has increased from 9 in 2008 to 17 in 2012.

B. Registrations and Student Credit Hours by Student Level (data in Appendix B)

Overall, in Fall 2008 there were 4464 student registrations in Biology and a student credit hour count of 9622. In Fall 2012, the number of student registrations had grown to 7254, and student credit hours increased to 15,401. The number of laboratory sections has also increased rather dramatically. In the 2006-2007 academic year, 98 laboratory sections were offered and there were 1870 registrations. In 2012-2013, there were 148 laboratory sections with 3296 registrations. It is likely that even more laboratory sections will be added in the next academic year.

Student credit hours have been steadily increasing at all student levels. Broken down by student level in three of the years, AY 2008, AY 2010 and AY 2012, numbers are

	2008	2010	2012
Freshman	2056	2814	3233
Sophomore	3511	5133	6389
Junior	1629	2311	2611
Senior	2152	2614	3049
Non-degree	257	228	70
Post BS licensure	17	56	49

C. Registrations and Student Credit Hours by Course Level

The student credit hours for 100-, 200-, 300- and 400-level courses in 2008 were 2056, 3511, 1629, and 2152, respectively, and had grown to 3233, 6389, 2611, and 3049 in 2012. Registrations in 2008 were 1006, 1644, 732, and 958, while in 2012 they were 1602, 3027, 1171, and 1395.

D. Number of Graduates

For the Biology concentration, there were 42 graduates in 2012, and for the secondary education concentration there were 4 graduates.

E. One-year Retention Rates and Four- and Six-Year Graduation Rates

Campus-wide, the retention rate (Appendix B) for first-time students in Bachelors degree programs has increased from 60% in 2006 to 64% from Fall 2010 to Fall 2011. The four-year graduation rate for 2008 was 16%, and the six-year graduation rate for 2006 was 29%. It is more difficult to track retention within the major, but the appendix includes data on retention to the next student level from Fall 2011 to Fall 2012, tracking students' status in the following year. Also included is the number of graduates those years. Retention for freshman-level Associates degree-seeking students is overall lower than that seen in either retention at the sophomore level in the A.S. or in any of the levels in the Bachelors degree-seeking students. Retention was only 44% and 36%, respectively, for freshman Associates degree students. Retention improved for sophomore level Associates students and for Bachelors degree-seeking students at any level, but the numbers were highly variable, ranging from 49% to 75% retention.

F. Student Successes

Students in the Biology program have had many successes both as undergraduates and in acceptance into a variety of post-baccalaureate programs. A sampling of student successes follows. At the undergraduate level, a variety of student researchers have won awards at Tri Beta conventions and at CMU's Student Showcase. At the 4th Annual Student Showcase on April 26, 2013, Alicia Crispin won in the Sciences, Track 2A. The title of her presentation was "The effect of elevation on caterpillar development time." Jessica Hartney and Nathan Stevenson won in the Sciences Track 2C with their presentation, "Investigations into a zoospore lysing agent made from petunia late blight lesions." CMU hosted the annual regional Tri Beta conference April 12-13, 2013.

Attendees came from Adams State University, University of Colorado-Denver, University of Northern Colorado, and CSU-Pueblo. Ellen Garcia placed first in the Presentations-Frank G. Brooks Award, and April Ilacqua placed second in the posters-John C. Johnson Award. Seven other Biology students participated. April Ilacqua also won second place in the Tri Beta National Conference held in Puerto Rico in May of 2012.

CMU students, as well as students from other institutions, participate in the summer Saccomanno Internship Program in Biological Research. The six students from this past summer gave presentations on August 14, 2013. The students, their home institutions, their research mentors, and their project titles are listed below:

Arielle Baker
CU-Boulder
Kyle McQuade, Ph.D.
Isoprenylcysteine Methylation and Vesicle Trafficking in Dictyostelium

Kiley DeSanto
CMU
Aparna Palmer, Ph.D.
A Preliminary Study of Population Genetic Differentiation in a Coastal Polychaete Species

April Ilacqua
CMU
Kyle McQuade, Ph.D.
Determining the Mechanism by which the Green Tea Catechin Epigallocatechin Gallate (EGCG) Affects Cell Motility in Dictyostelium

Beth McBride
CMU
Susan Longest. Ph.D.
The Effects of Climate Change on the Breeding Behavior of Tree Swallows and Violet-Green Swallows in Western Colorado

Jade Moret
CMU
Tom Walla, Ph.D.
Effect of Host Quality and Elevation on *Eois* Larvae

Emily Roberts
CMU
Kelly Jean Craig, Ph.D.
Mitochondrial Function in an Invasive in vitro Model of Breast Cancer

Our students are also accepted into summer internship programs. Oscar Paniagua-Morales completed a Johns Hopkins Summer Internship in a laboratory studying potential mechanisms of resistance to apoptosis in non-small cell lung carcinoma. He also won a Federation of American Societies for Experimental Biology MARC travel award to present his research at the Annual Biomedical Research Conference for Minority Students meeting in November 2013 in Nashville.

Our graduates have gone on to medical school, dental school, and graduate programs. Joe Adragna, Sarah Tait, and Joshua Bollan were accepted into UCHSC medical school, Everett Austin into CU medical school, and Rebecca Eilts into Pittsburgh dental school. Julie Fritz is a Ph.D. candidate at Emory University, and Tim Poor is a Masters student at Brigham Young University.

4. ACADEMIC PROGRAM RESOURCES

A. Faculty

In Fall of 2006, the Biology program had 12 tenured or tenure-track faculty, 8 of whom were full professors, 3 full-time instructors, and 3 part-time lecturers. As of Fall 2013, we still have 12 tenured or tenure-track faculty plus two faculty members in transitional retirement. A search is currently underway for a tenure-track position and a full-time instructor position. There are now 4 full-time instructors plus a split appointment instructor with the Physical and Environmental Sciences department and 7 part-time lecturers. Two of the "part-time" lecturers are teaching a full load of courses this year. There are also 3 part-time instructors at the Montrose campus.

Faculty have a heavy teaching load of 12 hours of load credit each semester; they often teach different courses each semester as well as teaching courses that may be taught alternate years. Load credit is based on the lecture credit hours plus a formula for laboratory credit based on the total lab hours and number of times the lab meets per week. For example, a 1 credit hour lab that meets for 3 hours once per week is 2 hours of load credit.

In addition to teaching, tenure-track faculty as well as many of the instructor faculty are actively involved in service, advising, and scholarship activities. All members of the department are involved in both departmental and campus-wide committees, and many are active in professional societies and in the community.

The advising load is also heavy. Tenured and tenure-track faculty are assigned advisees based primarily on student interest in the faculty member's area of expertise. The average number of advisees per faculty member is 57 students and ranges from 31 advisees for new faculty up to 86 advisees for more experienced faculty. Instructors advise informally or assist in the campus-wide advising sessions.

Research activities are often additional activities on top of the faculty teaching load. There is a formula to assign load credit for research, but it is contingent on covering all

the required courses each semester. The load formula is 0.2 hours of load per student credit hour. By this formula, if a faculty member has 5 research students in either BIOL 387 Structured Research or in BIOL 487 Advanced Research and all 5 students are signed up for 3 credit hours (both courses have variable credit from 1-3 credit hours), the faculty member could receive a 3-hour load reduction. Because of the heavy teaching load, it is more typical for faculty members with research students to receive 1-2 credit hours toward their teaching load (if they have 3 or more students), but they do not receive load credit for 1 or 2 students. Undergraduate research is one of our strengths, but is also a challenge because of the lack of time and resources.

1) Ratio of full-time equivalent students to full-time equivalent faculty (Appendix, Biology Data)

Along with increasing enrollments in all of our courses, the ratio of full-time equivalent students (FTES) to full-time equivalent faculty (FTEF) has also been increasing, with a spike in AY 2010. At the time of the last program review in AY 2005, the total FTES was 282, and the FTES:FTEF ratio was 16.60. In AY 2010, the FTES had grown to 439.5, and the FTES:FTEF ratio was 23.1. In AY 2012, the FTES was 513.4, and the FTES:FTEF ratio was 21.6.

2) Course credit hours and student credit hours by faculty type (Appendix, Biology Data)

There has been a troubling trend to higher percentages of our courses being taught by part-time faculty. Looking at the student credit hour (SCH) data from the first program review in AY2005, the tenured and tenure-track faculty taught 5559 SCH or 67%, while part-time faculty taught 953 SCH or 12%. In AY 2010, tenured and tenure-track faculty taught 6404 SCH or 49% of the total SCH, while part-time faculty taught 28%. In AY 2012, we increased the number of full-time instructors and replaced a tenure-track position that had been vacant since 2010. These additions helped reduce the percentage of SCH taught by part-time faculty. The proportion of SCH taught by tenured and tenure-track faculty still decreased slightly compared to 2010, to 7180 SCH or 47% of the total, but the SCH taught by part-time faculty decreased somewhat to 3146 or 20% of the total.

3) Faculty successes

Refer to the individual vitae for more complete information. The Biology faculty are excellent teachers, dedicated to preparing their students for success as well as contributing to the University in service and advising. In addition, many of the faculty excel in scholarship with a variety of peer-reviewed publications and grant awards.

4) Faculty curriculum vitae (Appendix C)

A summary is presented below.

<u>Tenured/tenure-track faculty</u>:

Margot Becktell, Assistant Professor; B.S., Mesa State College; Ph.D., Cornell University.

Kelly Jean Craig, Assistant Professor; B.S., University of Kansas; Ph.D., Georgetown University.

Paul Hampton, Assistant Professor; B.S., Eastern Illinois University; M.S., University of Texas at Tyler; Ph.D., University of Louisiana at Lafayette.

Eriek Hansen, Assistant Professor, B.S., Utah State University; M.S., Utah State University, Ph.D., University of Wyoming, Laramie.

Susan Longest, Assistant Professor; B.S., Cornell University; M.S., Ph.D., University of Chicago.

Denise McKenney, Professor and Department Head; B.S., New Mexico State University; Ph.D., North Carolina State University-Raleigh.

Kyle McQuade, Associate Professor; B.S., Millikin University; Ph.D., University of Wisconsin.

Aparna Palmer, Professor; B.A., B.S., Colorado State University; Ph.D., Washington State University.

Stephen Stern, Assistant Professor; B.S., University of North Carolina-Asheville; Ph.D., University of Utah.

Thomas Walla, Professor; B.A., University of California-San Diego; Ph.D., University of Oregon-Eugene.

Carrie McVean Waring, Professor; B.S., D.V.M., Colorado State University.

Steve Werman, Professor and Assistant Vice President for Academic Affairs; B.S., M.S., California State University— Long Beach; Ph.D., University of Miami.

Currently in transitional retirement:
Bruce Bauerle, B.A., University of Kansas; M.S., University of Missouri; D.A., University of Northern Colorado.

Gary McCallister, B.S., M.S., Brigham Young University; D.A., University of Northern Colorado.

Instructors:
Jonathan Cooley, Instructor of Biology and Geology; B.A., University of Colorado; M.S., Montana State University.

Richard Dujay, B.S., M.S., Ph.D., Colorado State University.

Shay West, B.S., Mesa State College; Ph.D., University of Colorado-Denver.

Stephanie Matlock, B.A., University of Colorado-Boulder; M.S., Montana State University-Bozeman.

Zeynep Ozsoy Bean, B.S. Bogazici University-Turkey; Ph.D., University of North Carolina-Chapel Hill.

Part-time lecturers on the main campus: The lecturers are hired each semester, so the information below is typical of the high quality of most our part-time people.

Russell Copelan, B.A., Stanford; M.D., UCLA Medical School.

Tracy Cyr, B.S., University of California-Riverside; M.D. Washington State University; Ph.D., University of Missouri.

Matthew Garhart, B.S., Mesa State College; M.S., Colorado State University.

George Gromke, B.S., University of Illinois; D.O. Midwestern University, Chicago.

Kelli Kessell, B.S., Colorado State University; M.S., University of Northern Colorado.

Jeffrey McCloskey, B.S., East Stroudsburg University; D.C., Logan College of Chiropractic.

Paul Simmons, M.D., University of Colorado.

B. Financial Information

1) Total budget revenues and program expenditures

In the 2005-2006 academic year, the total budget was $1,094,487 with FTE of 17.05. For the current 2013-2014 academic year, the budget is $1,570, 397.

Lab fees are collected for each student enrollment and are used to directly support the equipment and supplies necessary to stay current in the field. The funds roll over each year, allowing funds to be "saved" for major expenditures. In recent years, all the microscopes in several labs have been replaced with the lab fee funds, and currently funds are being saved up to replace all the microscopes in BIOL 105L Attributes of Living Systems Laboratory, our entry-level freshman course for majors. For the current budget year, the total funds, both rollover and current-year lab fees, is expected to be $92,000.

2) External funding and potential opportunities for obtaining external funds

The Saccomanno Internship Program in Biological Research is funded by the Saccomanno Higher Education Foundation and provides summer research opportunities to CMU students or Mesa County residents attending college under the mentorship of faculty members. Students also meet to discuss current topics in biomedical research including research ethics and scientific publication and presentation. In a three-year period, 11 interns have completed research projects.

C. Library Assessment

The library assessment (Appendix) also considered our proposal to add concentrations to our program. Overall, the program is well supported for all areas of the concentration. An identified weakness is in the currency of the print monograph collections, and the number of titles in the reference collection could be updated. In addition, the forensic entomology area could use strengthening.

D. Physical Facilities

Faculty offices are located in the Wubben Science building with most faculty members grouped together in a suite of offices on the second floor. Full-time faculty all have individual offices while part-time faculty share offices, with 2 to 3 faculty sharing two office spaces. Part-time faculty are grouped based on their teaching schedules to minimize overlapping times when they would be in the office at the same time.

The first expansion of the facilities occurred in 1996 when our teaching laboratory space increased from 3 to 6 teaching laboratories plus the addition of one laboratory dedicated for student research. One of the teaching laboratories was later repurposed for research as our undergraduate research program began to take off, leaving 5 teaching laboratories. In the most recent expansion, our teaching laboratory space increased from 5 to 7 laboratories; this number grew to 8 total teaching laboratories with the acquisition in Fall 2012 of a first floor space dedicated to gross anatomy. Most of the labs are on the second floor, with one teaching laboratory focused on plant biology on the third floor that has easy access to the greenhouse.

Our most recent expansion also added significantly to the undergraduate research space on the third floor of Wubben Science with 3 dedicated laboratories and a preparation room that includes an autoclave, ice machine, and distiller. Bench space in the research laboratories is allocated based on primary research needs. There are two research spaces with an emphasis on molecular biology and one with an emphasis on organismal biology.

We were also able to move the Walter Almond Kelley Herbarium from the first floor to the third floor, which greatly increased access to both the herbarium and the research space required to sort and catalog additional specimens. A current project involving students is currently underway to digitize the entire herbarium collection.

The teaching laboratory preparation room was also expanded, and we gained much needed storage space on the first floor for field trip-related materials, as well as storage space on the second floor for various plant and animal specimens. We also have a microscopy center that includes scanning and transmission electron microscopes, a 3D microscope, a fluorescence microscope, and several other types of microscopes. In the research space, we have additional research grade microscopes, including a confocal microscope, as well as PCR thermocyclers, gel elecrophoresis equipment, a photodocumentation system, water baths, incubators, refrigerators including two -80 degree centigrade freezers, and a Biosafety level II laminar flow hood and a fume hood.

E. Instructional Technology and Equipment

All lecture rooms and laboratories at CMU are "smart" rooms with networked computers and projectors, DVD players, and document cameras. In addition, we have 12 laboratory laptops that can be moved into any lab and connected to the network. Many of the faculty members have supplemental shells for their courses utilizing the Desire 2 Learn platform.

F. Efficiencies in the Way the Program is Operated

The department operates very efficiently with faculty teaching lecture and lab components, most without the benefit of student assistants. In order to give students experience in laboratory teaching, we do offer BIOL 493 Laboratory Teaching Practicum for 1 credit hour under the direct supervision of the faculty member. As our laboratory size has increased to capacity in most lab sections, the student may provide much needed assistance during busy labs. Offering a class for credit is a very efficient and cost-effective way to gain help in the labs.

Our laboratory coordinator, Mr. Rod Read, is responsible for preparing laboratory materials each week and supervising student workers, as well as ordering most of the materials and equipment needed for the laboratories each year. Without a lab coordinator, the workload for faculty would be unmanageable.

5. STUDENT LEARNING OUTCOMES AND ASSESSMENT

A. Student Learning Outcomes

After intensive work last year, both within the department and campus-wide, student learning objectives have been developed for all programs, as well as an assessment plan (see Appendix D). Campus-wide, all CMU baccalaureate graduates are expected to attain proficiency in critical thinking, communication, and quantitative fluency. In addition, in the Biology concentrations there are four student learning outcomes:

1. Students will demonstrate a broad comprehensive knowledge of the main areas of biology (including evolution, diversity, ecology, cell biology, and genetics) and the ability to apply this knowledge to address new questions.

2. Students will demonstrate the ability to use science as a way of thinking and problem solving. They will be able to make key observations, ask questions, formulate hypotheses, design experiments, collect and analyze data, draw logical conclusions, and explain and defend those conclusions to others.

3. Students will demonstrate the ability to critically search, read, evaluate, and discuss primary literature.

4. Students will demonstrate effective Biological communication skills, both in writing and orally.

All of our majors courses have been mapped based on these student learning objectives (curriculum map in Appendix D).

In the secondary teaching concentration, there are four additional learning outcomes:

1. Demonstrate understanding that the learning and developmental patterns vary among individuals, that learners bring unique individual differences to the learning process, and that learners need supportive and safe learning environments to thrive.

2. Apply content knowledge while working with learners to access information, apply knowledge in real world settings, and address meaningful issues to assure learner mastery of the content.

3. Integrate assessment, planning, and instructional strategies in coordinated and engaging ways through multiple means of communication.

4. Engage in meaningful and intensive professional learning and self-renewal by regularly examining practice through ongoing study, self-reflection, and collaboration.

B. Direct and Indirect Measurements

Indirect measurements of student satisfaction were obtained from the Biology exit survey taken by graduating seniors and from the alumni survey that was conducted for the first time this year. The alumni survey results and a copy of the questions included on the exit survey are in Appendix E. The alumni survey had low participation with only 12 completed surveys out of 204 requests. The low participation makes drawing conclusions difficult. However, the responses were overwhelmingly positive. Eighty-three percent of the alumni were either very or generally satisfied with their undergraduate education, and 75% of the respondents rated the overall quality of their education as very high or high. Of significance to our departmental discussions of dividing into four specific concentrations, there were several written comments suggesting that more specific course selections on our program sheet could better prepare students for their future career.

On the most recent exit survey for AY 2012, only 11 of our graduating seniors completed the survey. Of the completed survey, 90% were satisfied or very satisfied with the content and structure of the program, with 90% rating their competency in critical thinking skills, quantitative reasoning, written communication skills, and oral communication skills as high. The exit survey also confirms the improvements in our laboratory facilities in recent years with 90% of the students being somewhat or very satisfied with the quality of the facilities and equipment in labs.

Direct measurements include PRAXIS II licensure exams taken by students in the teacher education concentration and the Major Fields Test (MFT) for all graduating seniors in the Biology concentration students. In a recent change, graduating teacher education students will also be required to take the MFT. There will also be added assessments to all core courses in the Biology concentration, most of which are also required of the secondary teaching concentration.

The data from the most recent MFT and PRAXIS can be found in Appendix A. The demographic data lend support for increasing our undergraduate research program. For the last 4 years, between 49% and 74% of the respondents indicated that they planned to go on for a Masters or a Doctorate after completing their Bachelors degree.

The MFT data provide four subscores in Cell Biology; Molecular Biology and Genetics; Organismal Biology; and Population Biology, Evolution, and Ecology. There are also nine assessment indicators in Biochemistry and Cell Energetics; Cellular Structure, Organization, and Function; Molecular Biology and Molecular Genetics; Diversity of Organisms; Organismal-Animals; Organismal-Plants; Population Genetics and Evolution; Ecology; and Analytical Skills. The assessment indicator for Biochemistry and Cell Energetics had been consistently in the 30% correct range in the years prior to our last program review. We utilized this assessment data to increase the number of faculty with expertise in molecular biology. Modest improvements seemed to be occurring with the score reaching into the 40% range, but last year it was back down to 39% correct. While there have been some ups and downs over the years, most of the other assessment indications have stayed in the 50% correct range, making it difficult to determine their significance. The means of the four subscores also hover around 50, regardless of any changes to the curriculum. Since students do not typically study for the MFT and their scores do not affect graduation, perhaps the data are not as useful as we would like. We are exploring whether MCAT and GRE scores would be more reliable indicators.

For the Biology Secondary Teaching concentration, the main direct measure of the success of the program has been the PRAXIS II licensing exam taken by all majors. Appendix A contains the most recent licensing exam results. The results have been excellent. Between 11/17/07 and 4/29/13, a total of 34 majors have taken the exam, with only 3 students failing (91% success rate). Assessment data are included in the Appendix. The MFT had been eliminated for the teacher education students because of their relatively weak Biology content preparation (core courses in BIOL 105/105L, 106/106L, 107/107L and 10 upper-level Biology electives), so we do not currently have MFT data for this concentration, but the MFT requirement has been added back in order to help

identify any areas of deficiency that could be corrected and will provide more assessment information in the future.

Other changes to the secondary education program, including the addition of a new required course, BIOL 385 Nature and Philosophy of Science, and requiring the same capstone course of BIOL 483 Senior Thesis as our Biology concentration, came too late to achieve NCATE accreditation. A copy of the National Science Teachers Association (NSTA) SPA report evaluation as part of our NCATE application has been included in Appendix G. We are hopeful that our program will meet national standards in the next submission cycle.

General education courses (BIOL 101/101L, 102/102L and 105/105L) have had regular evaluation and assessment through 2010 on a rotation schedule, using both direct measures with course-imbedded assessment questions, and indirect measures, in the case of BIOL 105/105L, with the exit survey completed by Biology graduating seniors. Appendix F contains the most recent assessments. Overall, our assessments were acceptable, but we needed more work on setting the benchmarks for success. Campus-wide, the general education program is undergoing significant review and overhaul, with a new evaluation system coming.

C. Program Improvements

In the Biology concentration, several courses have been added to either improve the program or to address needs in other departments. BIOL 208/208L Fundamentals of Ecology and Evolution was added in 2008, along with a requirement that students must choose at least one course from BIOL 302 Cellular Biology, BIOL 341/341L General Physiology, or BIOL 421/421L Plant Physiology. Both changes were to address deficiencies in ecological and evolutionary understanding as well as to strengthen the knowledge of molecular biology processes.

BIOL 409/409L Gross and Developmental Human Anatomy was added in 2011 both to increase choices in the Anatomical and Physiological category for our majors and also to support a new Exercise Science concentration in Kinesiology. We have also offered for the first time in Fall 2013 two new courses primarily intended to support a new minor in Forensic Anthropology. BIOL 217/217L Forensic Entomology and BIOL 410/410L Human Osteology are optional and required, respectively, for the minor in Forensic Anthropology and also provide elective courses for students interested in forensics.

An additional course has been modified to meet general education science requirements. BIOL 250/250L General Microbiology will be offered as a general education option for the first time in Spring 2014. In addition to providing an excellent general education choice for non-majors with an interest in microbiology, it is also hoped that pre-Nursing students will choose General Microbiology as their general education choice in order to provide important background information about microorganisms and their role in health and disease. The Nursing program eliminated their requirement for microbiology in 2006 but is supportive of this option for their students.

The department is also actively exploring offering specific concentrations within Biology rather than relying on a single concentration with individualized advising (see Future Program Plans, below). A disadvantage to our current single concentration has been in the area of advising if students choose not to take recommended course work. Students interested in graduate school in biological research must complete organic chemistry in order to be competitive, but organic chemistry is not required in the program. A change to multiple concentrations is expected to greatly improve the preparation of our majors for specific fields by ensuring that necessary prerequisites are completed. Such a change is supported by exit survey comments that suggest students would like to see the necessary course work for their future plans included on their program sheet.

6. FUTURE PROGRAM PLANS

A. Vision

Our vision is to improve advising of our majors to better meet the needs of our diverse group of students, and to expand our undergraduate research program.

Last year, we met to discuss proposals to divide our single Biology concentration into four specific concentrations or tracks: General Biology (essentially the same as our current program); Cell, Developmental, and Molecular Biology; Ecology, Evolutionary, and Organismal Biology; and Pre-Health and Biomedical. All concentrations would share a common core. Preliminary curricula have been considered for each proposed concentration, and work will continue into the Spring 2014 semester.

B. Strengths and Challenges

The faculty members in the Biology Department are dedicated to teaching and continually strive to provide a quality, personal education. In order to maintain and improve the quality of our program, we have identified several areas that deserve attention. One challenge is to improve assessment and maintain stronger ties with our graduates. We believe the assessment plan put in place this year will yield valuable information to further improve our program. We would also like to begin gathering both MCAT and GRE data, in addition to MFT data, to provide more direct assessment data of the quality of our program. We are also exploring the use of social media and "alumni social" events to contact and keep in touch with our alumni.

Undergraduate research is another one of the strengths of our program, and the availability of a vigorous and growing undergraduate research program is something that is very important to us. The challenges we face as we look to increase participation in research activities include providing enough time for faculty mentors to provide quality undergraduate research experiences, and maintaining or increasing financial support for laboratory equipment and supplies. We would also like to provide more group experiences for our student researchers, such as weekly discussion groups and seminars during the academic year.

We have concerns about the quality and consistency of our part-time lecturers. The available pool of lecturers fluctuates from year to year. We would like to further reduce the number of courses taught by part-time faculty. We will seek more tenure-track hires in the future, which we believe will strengthen our program.

C. Potential Resources

In addition to current resources, Dr. Tom Walla has initiated discussion on how to specifically strengthen and improve our current undergraduate research program. We have met as a department to discuss possible changes to our allocation of research load credit as well as to explore possible funding sources. Funding could come from the Alumni Association and from partnerships with technology firms or other organizations or businesses. These discussions will continue into the Spring 2014 semester.

Appendix A

MFT and PRAXIS Results

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Cohort: Combined

Fall 2006-Spring 2007

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	39
2	Cellular Structure, Organization, Function	56
3	Molecular Biology and Molecular Genetics	48
4	Diversity of Organisms	52
5	Organismal - Animals	62
6	Organismal - Plants	46
7	Population Genetics and Evolution	59
8	Ecology	57
9	Analytical Skills	54

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **39**

Students tested: **39**

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Cohort: Combined

Fall 2007-Spring 2008

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	38
2	Cellular Structure, Organization, Function	52
3	Molecular Biology and Molecular Genetics	44
4	Diversity of Organisms	48
5	Organismal - Animals	58
6	Organismal - Plants	44
7	Population Genetics and Evolution	60
8	Ecology	54
9	Analytical Skills	53

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **35**

Students tested: **35**

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Cohort: Combined

Fall 2008-Spring 2009

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	36
2	Cellular Structure, Organization, Function	50
3	Molecular Biology and Molecular Genetics	42
4	Diversity of Organisms	49
5	Organismal - Animals	58
6	Organismal - Plants	44
7	Population Genetics and Evolution	54
8	Ecology	58
9	Analytical Skills	52

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **39**

Students tested: **39**

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Cohort: Combined

Fall 2009-Spring 2010

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	36
2	Function	50
3	Genetics	42
4	Diversity of Organisms	49
5	Organismal - Animals	58
6	Organismal - Plants	44
7	Population Genetics and Evolution	54
8	Ecology	58
9	Analytical Skills	52

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **39**

Students tested: **39**

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology
Form Code: 4GMF
Institution: Colorado Mesa University
Cohort: Fall 2010 - Spring 2011 - Biology
Closed on: November 04, 2011

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	43
2	Function	49
3	Genetics	46
4	Diversity of Organisms	43
5	Organismal - Animals	34
6	Organismal - Plants	27
7	Population Genetics and Evolution	50
8	Ecology	47
9	Analytical Skills	46

Students responding to less than 50% of the questions: **0**
Students in frequency distribution: **34**
Students tested: **34**

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology
Form Code: 4GMF
Institution: Colorado Mesa University
Cohort: Combined
Fall 2011-Spring 2012

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	40
2	Function	45
3	Genetics	43
4	Diversity of Organisms	42
5	Organismal - Animals	36
6	Organismal - Plants	33
7	Population Genetics and Evolution	52
8	Ecology	49
9	Analytical Skills	44

Students responding to less than 50% of the questions: **0**
Students in frequency distribution: **37**
Students tested: **37**

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Test: Biology
Form Code: 4GMF
Institution: Colorado Mesa University
Cohort: Combined
Fall 2012-Spring 2013

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Biochemistry and Cell Energetics	39
2	Function	47
3	Genetics	42
4	Diversity of Organisms	39
5	Organismal - Animals	36
6	Organismal - Plants	34
7	Population Genetics and Evolution	52
8	Ecology	47
9	Analytical Skills	45

Students responding to less than 50% of the questions: **0**
Students in frequency distribution: **41**
Students tested: **41**

DEPARTMENTAL DEMOGRAPHIC SUMMARY

Test: Biology
Form Code: 4BMF
Institution: Colorado Mesa University
Cohort: Combined
Fall 2008-Spring 2009

	Students	Students
Gender		
Male	13	38
Female	18	53
No Response	3	9
Ethnicity		
American Indian or Alaskan Nativ	0	0
Asian American or Pacific Islande	0	0
Black or African American	0	0
Mexican American	2	6
Puerto Rican	0	0
Latin American or Other Hispanic	3	9
White	25	74
Other	1	3
No Response	3	9
Educational Level		
Freshman (0-30 credits)	0	0
Sophomore (31-60 credits)	0	0
Junior (61-90 credits)	0	0
Senior (91-120 credits)	30	88
Graduate (over 120 credits)	0	0
Other	0	0
No Response	4	12
Transfer Student		
No	22	65
Yes	7	21
No Response	5	15
Enrollment Status		
Full-time	24	71
Part-time	6	18
No Response	4	12
Best Language		
English	31	91
Other	0	0
Both	0	0
No Response	3	9

	Students	Students
Major Distance Learning Courses		
None	21	62
Less than 40%	9	26
40% to 90%	0	0
More than 90%	0	0
No Response	4	12
Overall Undergraduate GPA		
3.50 - 4.00	12	35
3.00 - 3.49	15	44
2.50 - 2.99	3	9
2.00 - 2.49	1	3
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	3	9
Major Field GPA		
3.50 - 4.00	14	41
3.00 - 3.49	14	41
2.50 - 2.99	3	9
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	3	9
Education Planned		
Associate	0	0
Bachelors	11	32
Masters	5	15
Doctorate	10	29
Other	0	0
Undecided	4	12
No Response	4	12

DEPARTMENTAL DEMOGRAPHIC SUMMARY

Test: Biology
Form Code: 4BMF
Institution: Colorado Mesa University
Cohort: Combined
Fall 2009-Spring 2010

	Students	Students
Gender		
Male	13	33
Female	23	59
No Response	3	8
Ethnicity		
American Indian or Alaskan Nativ	0	0
Asian American or Pacific Islande	1	3
Black or African American	1	3
Mexican American	1	3
Puerto Rican	0	0
Latin American or Other Hispanic	1	3
White	29	74
Other	2	5
No Response	4	10
Educational Level		
Freshman (0-30 credits)	0	0
Sophomore (31-60 credits)	0	0
Junior (61-90 credits)	0	0
Senior (91-120 credits)	35	90
Graduate (over 120 credits)	1	3
Other	0	0
No Response	3	8
Transfer Student		
No	26	67
Yes	10	26
No Response	3	8
Enrollment Status		
Full-time	33	85
Part-time	3	8
No Response	3	8
Best Language		
English	36	92
Other	0	0
Both	0	0
No Response	3	8

	Students	Students
Major Distance Learning Courses		
None	23	59
Less than 40%	12	31
40% to 90%	0	0
More than 90%	0	0
No Response	4	10
Overall Undergraduate GPA		
3.50 - 4.00	13	33
3.00 - 3.49	15	38
2.50 - 2.99	7	18
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	4	10
Major Field GPA		
3.50 - 4.00	16	41
3.00 - 3.49	18	46
2.50 - 2.99	1	3
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	4	10
Education Planned		
Associate	0	0
Bachelors	4	10
Masters	11	28
Doctorate	18	46
Other	0	0
Undecided	3	8
No Response	3	8

DEPARTMENTAL DEMOGRAPHIC SUMMARY

Test: Biology
Form Code: 4GMF
Institution: Colorado Mesa University
Cohort: Fall 2010 - Spring 2011 - Biology
Closed on: November 04, 2011

	Students	Students
Gender		
Male	7	21
Female	24	71
No Response	3	9
Ethnicity		
American Indian or Alaskan Nativ	0	0
Asian American or Pacific Islande	0	0
Black or African American	1	3
Mexican American	0	0
Puerto Rican	0	0
Latin American or Other Hispanic	1	3
White	27	79
Other	2	6
No Response	3	9
Educational Level		
Freshman (0-30 credits)	0	0
Sophomore (31-60 credits)	0	0
Junior (61-90 credits)	0	0
Senior (91-120 credits)	30	88
Graduate (over 120 credits)	0	0
Other	0	0
No Response	4	12
Transfer Student		
No	23	68
Yes	6	18
No Response	5	15
Enrollment Status		
Full-time	24	71
Part-time	7	21
No Response	3	9
Best Language		
English	29	85
Other	0	0
Both	0	0
No Response	5	15

	Students	Students
Major Distance Learning Courses		
None	22	65
Less than 40%	7	21
40% to 90%	0	0
More than 90%	0	0
No Response	5	15
Overall Undergraduate GPA		
3.50 - 4.00	9	26
3.00 - 3.49	18	53
2.50 - 2.99	3	9
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	4	12
Major Field GPA		
3.50 - 4.00	9	26
3.00 - 3.49	16	47
2.50 - 2.99	4	12
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	5	15
Education Planned		
Associate	0	0
Bachelors	5	15
Masters	8	24
Doctorate	11	32
Other	0	0
Undecided	6	18
No Response	4	12

DEPARTMENTAL DEMOGRAPHIC SUMMARY

Test: Biology
Form Code: 4GMF
Institution: Colorado Mesa University
Cohort: Combined
Fall 2011-Spring 2012

	Students	Students
Gender		
Male	14	38
Female	23	62
No Response	0	0
Ethnicity		
American Indian or Alaskan Nativ	0	0
Asian American or Pacific Islande	1	3
Black or African American	0	0
Mexican American	3	8
Puerto Rican	1	3
Latin American or Other Hispanic	2	5
White	28	76
Other	1	3
No Response	1	3
Educational Level		
Freshman (0-30 credits)	0	0
Sophomore (31-60 credits)	0	0
Junior (61-90 credits)	0	0
Senior (91-120 credits)	28	76
Graduate (over 120 credits)	7	19
Other	2	5
No Response	0	0
Transfer Student		
No	25	68
Yes	12	32
No Response	0	0
Enrollment Status		
Full-time	35	95
Part-time	2	5
No Response	0	0
Best Language		
English	35	95
Other	0	0
Both	2	5
No Response	0	0

	Students	Students
Major Distance Learning Courses		
None	23	62
Less than 40%	11	30
40% to 90%	0	0
More than 90%	0	0
No Response	3	8
Overall Undergraduate GPA		
3.50 - 4.00	11	30
3.00 - 3.49	8	22
2.50 - 2.99	15	41
2.00 - 2.49	0	0
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	3	8
Major Field GPA		
3.50 - 4.00	12	32
3.00 - 3.49	9	24
2.50 - 2.99	12	32
2.00 - 2.49	1	3
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	3	8
Education Planned		
Associate	1	3
Bachelors	6	16
Masters	6	16
Doctorate	18	49
Other	0	0
Undecided	6	16
No Response	0	0

DEPARTMENTAL DEMOGRAPHIC SUMMARY

Test: Biology
Form Code: 4GMF
Institution: Colorado Mesa University
Cohort: Combined
Fall 2012-Spring 2013

	Students	Students
Gender		
Male	12	29
Female	27	66
No Response	2	5
Ethnicity		
American Indian or Alaskan Nativ	0	0
Asian American or Pacific Islande	1	2
Black or African American	2	5
Mexican American	2	5
Puerto Rican	0	0
Latin American or Other Hispanic	1	2
White	29	71
Other	4	10
No Response	2	5
Educational Level		
Freshman (0-30 credits)	0	0
Sophomore (31-60 credits)	0	0
Junior (61-90 credits)	0	0
Senior (91-120 credits)	36	88
Graduate (over 120 credits)	3	7
Other	0	0
No Response	2	5
Transfer Student		
No	31	76
Yes	8	20
No Response	2	5
Enrollment Status		
Full-time	36	88
Part-time	3	7
No Response	2	5
Best Language		
English	38	93
Other	0	0
Both	0	0
No Response	3	7

	Students	Students
Major Distance Learning Courses		
None	27	66
Less than 40%	8	20
40% to 90%	0	0
More than 90%	0	0
No Response	6	15
Overall Undergraduate GPA		
3.50 - 4.00	14	34
3.00 - 3.49	14	34
2.50 - 2.99	9	22
2.00 - 2.49	1	2
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	3	7
Major Field GPA		
3.50 - 4.00	16	39
3.00 - 3.49	15	37
2.50 - 2.99	3	7
2.00 - 2.49	3	7
1.00 - 1.99	0	0
Less than 1.00	0	0
No Response	4	10
Education Planned		
Associate	0	0
Bachelors	17	41
Masters	7	17
Doctorate	13	32
Other	0	0
Undecided	1	2
No Response	3	7

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Fall 2006-Spring 2007

Closed on: Combined

TOTAL TEST		
Scaled Score Range	**Number in Range**	**Percent Below**
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	1	97
170-174	2	92
165-169	2	87
160-164	4	77
155-159	10	51
150-154	7	33
145-149	6	18
140-144	6	3
135-139	1	0
130-134	0	0
125-129	0	0
120-124	0	0

	Mean	**Standard Deviation**
Total Test Scaled Score	154	9
Subscore 1	52	12
Subscore 2	54	11
Subscore 3	55	10
Subscore 4	55	8

	Subscore 1		Subscore 2	
	Cell Biology		Molecular Biology and Genetics	
Scaled Score Range	**Number in Range**	**Percent Below**	**Number in Range**	**Percent Below**
100	0	100	0	100
95-99	0	100	0	100
90-94	0	100	0	100
85-89	0	100	0	100
80-84	1	97	0	100
75-79	1	95	0	100
70-74	3	87	3	92
65-69	1	85	3	85
60-64	4	74	4	74
55-59	3	67	10	49
50-54	8	46	8	28
45-49	5	33	4	18
40-44	7	15	3	10
35-39	5	3	1	8
30-34	1	0	3	0
25-29	0	0	0	0
20-24	0	0	0	0

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **39**

Students tested: **39**

Subscore 3		Subscore 4	
Organismal Biology		Population Biology, Evolution, and Ecology	
Number in Range	**Percent Below**	**Number in Range**	**Percent Below**
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
1	97	0	100
0	97	0	100
2	92	1	97
2	87	3	90
8	67	7	72
8	46	10	46
6	31	11	18
5	18	3	10
4	8	1	8
3	0	2	3
0	0	1	0
0	0	0	0
0	0	0	0

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Cohort: Combined

Fall 2007-Spring 2008

TOTAL TEST		
Scaled Score Range	**Number in Range**	**Percent Below**
200	0	100
195-199	0	100
190-194	0	100
185-189	1	97
180-184	1	94
175-179	1	91
170-174	1	89
165-169	2	83
160-164	1	80
155-159	4	69
150-154	6	51
145-149	6	34
140-144	7	14
135-139	3	6
130-134	2	0
125-129	0	0
120-124	0	0

	Mean	**Deviation**
Total Test Scaled Score	152	13
Subscore 1	50	15
Subscore 2	52	16
Subscore 3	52	13
Subscore 4	53	11

	Subscore 1		Subscore 2	
	Cell Biology		Molecular Biology and Genetics	
Scaled Score Range	**Number in Range**	**Percent Below**	**Number in Range**	**Percent Below**
100	0	100	0	100
95-99	0	100	0	100
90-94	0	100	1	97
85-89	1	97	1	94
80-84	0	97	1	91
75-79	2	91	1	89
70-74	2	86	1	86
65-69	0	86	2	80
60-64	3	77	2	74
55-59	4	66	4	63
50-54	2	60	3	54
45-49	7	40	5	40
40-44	1	37	7	20
35-39	10	9	1	17
30-34	2	3	6	0
25-29	0	3	0	0
20-24	1	0	0	0

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **35**

Students tested: **35**

Subscore 3		Subscore 4	
Organismal Biology		Ecology	
Number in Range	**Percent Below**	**Number in Range**	**Percent Below**
0	100	0	100
0	100	0	100
0	100	0	100
1	97	0	100
0	97	0	100
1	94	1	97
1	91	3	89
1	89	3	80
4	77	1	77
7	57	8	54
8	34	5	40
1	31	6	23
3	23	5	9
6	6	3	0
1	3	0	0
0	3	0	0
1	0	0	0

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Cohort: Combined

Fall 2008-Spring 2009

TOTAL TEST		
Scaled Score Range	**Number in Range**	**Percent Below**
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	1	97
170-174	1	94
165-169	4	82
160-164	1	79
155-159	5	65
150-154	4	53
145-149	8	29
140-144	4	18
135-139	4	6
130-134	1	3
125-129	1	0
120-124	0	0

	Mean	**Deviation**
Total Test Scaled Score	150	12
Subscore 1	47	13
Subscore 2	50	12
Subscore 3	53	13
Subscore 4	52	12

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **34**

Students tested: **34**

	Subscore 1		Subscore 2	
	Cell Biology		Molecular Biology and Genetics	
Scaled Score Range	**Number in Range**	**Percent Below**	**Number in Range**	**Percent Below**
100	0	100	0	100
95-99	0	100	0	100
90-94	0	100	0	100
85-89	0	100	0	100
80-84	0	100	1	97
75-79	0	100	0	97
70-74	1	97	0	97
65-69	4	85	2	91
60-64	1	82	4	79
55-59	0	82	5	65
50-54	10	53	3	56
45-49	6	35	7	35
40-44	3	26	7	15
35-39	2	21	2	9
30-34	1	18	2	3
25-29	3	9	1	0
20-24	3	0	0	0

Subscore 3		Subscore 4	
Organismal Biology		Ecology	
Number in Range	**Percent Below**	**Number in Range**	**Percent Below**
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
1	97	1	97
3	88	1	94
2	82	3	85
5	68	3	76
4	56	9	50
6	38	4	38
3	29	4	26
3	21	2	21
6	3	5	6
0	3	1	3
0	3	1	0
1	0	0	0

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Test: Biology

Form Code: 4BMF

Institution: Colorado Mesa University

Cohort: Combined

Fall 2009-Spring 2010

TOTAL TEST		
Scaled Score Range	**Number in Range**	**Percent Below**
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	0	100
170-174	1	97
165-169	2	92
160-164	6	77
155-159	6	62
150-154	8	41
145-149	5	28
140-144	4	18
135-139	3	10
130-134	2	5
125-129	2	0
120-124	0	0

	Mean	**Deviation**
Total Test Scaled Score	151	11
Subscore 1	47	14
Subscore 2	50	11
Subscore 3	52	12
Subscore 4	53	12

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **39**

Students tested: **39**

	Subscore 1		Subscore 2	
	Cell Biology		Molecular Biology and Genetics	
Scaled Score Range	**Number in Range**	**Percent Below**	**Number in Range**	**Percent Below**
100	0	100	0	100
95-99	0	100	0	100
90-94	0	100	0	100
85-89	0	100	0	100
80-84	0	100	0	100
75-79	0	100	0	100
70-74	2	95	1	97
65-69	2	90	3	90
60-64	6	74	4	79
55-59	1	72	5	67
50-54	6	56	5	54
45-49	7	38	8	33
40-44	4	28	7	15
35-39	6	13	4	5
30-34	0	13	1	3
25-29	3	5	1	0
20-24	2	0	0	0

Subscore 3		Subscore 4	
Organismal Biology		Ecology	
Number in Range	**Percent Below**	**Number in Range**	**Percent Below**
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
0	100	1	97
2	95	2	92
4	85	6	77
8	64	3	69
7	46	6	54
3	38	6	38
2	33	5	26
3	26	5	13
7	8	2	8
2	3	2	3
0	3	1	0
1	0	0	0

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Test: Biology

Form Code: 4GMF

Institution: Colorado Mesa University

Cohort: Fall 2010 - Spring 2011 - Biology

Closed on: November 04, 2011

TOTAL TEST		
Scaled Score Range	**Number in Range**	**Percent Below**
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	0	100
170-174	1	97
165-169	1	94
160-164	3	85
155-159	4	74
150-154	9	47
145-149	8	24
140-144	2	18
135-139	3	9
130-134	1	6
125-129	2	0
120-124	0	0

	Mean	**Deviation**
Total Test Scaled Score	149	11
Subscore 1	51	11
Subscore 2	51	14
Subscore 3	47	11
Subscore 4	50	11

	Subscore 1		Subscore 2	
	Cell Biology		Molecular Biology and Genetics	
Scaled Score Range	**Number in Range**	**Percent Below**	**Number in Range**	**Percent Below**
100	0	100	0	100
95-99	0	100	0	100
90-94	0	100	0	100
85-89	0	100	0	100
80-84	0	100	1	97
75-79	1	97	1	94
70-74	0	97	0	94
65-69	1	94	4	82
60-64	6	76	2	76
55-59	3	68	7	56
50-54	6	50	8	32
45-49	5	35	1	29
40-44	8	12	3	21
35-39	3	3	3	12
30-34	1	0	2	6
25-29	0	0	1	3
20-24	0	0	1	0

Students responding to less than 50% of the questions: **0**

Students in frequency distribution: **34**

Students tested: **34**

Subscore 3		Subscore 4	
Organismal Biology		Ecology	
Number in Range	**Percent Below**	**Number in Range**	**Percent Below**
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
0	100	0	100
1	97	0	100
1	94	1	97
2	88	6	79
4	76	7	59
3	68	5	44
12	32	4	32
4	21	6	15
2	15	3	6
0	15	1	3
5	0	0	3
0	0	1	0

Lname	Fname	G	Address
[redacted]			

Test Date			Score	Cut Score	Result	Content Sc	points Earned	Points Available	25th %ile	75th %ile	
11/17/2007	435		172	152	PASSED	I. SCIENTIF	8	12	7	10	
11/17/2007	435		175	152	PASSED	I. SCIENTIF	6	12	7	10	
11/17/2007	435		169	152	PASSED	I. SCIENTIF	7	12	7	10	
4/26/2008	435		157	152	PASSED	I. SCIENTIF	9	12	8	11	
4/26/2008	435		186	152	PASSED	I. SCIENTIF	9	12	8	11	
4/26/2008	435		154	152	PASSED	I. SCIENTIF	8	12	8	11	
9/13/2008	435		184	152	PASSED	I. SCIENTIF	10	12	7	10	
3/14/2009	435		164	152	PASSED	I. SCIENTIF	10	12	7	10	
3/14/2009	435		168	152	PASSED	I. SCIENTIF	7	12	7	10	
4/25/2009	435		177	152	PASSED	I. SCIENTIF	9	12	7	10	
9/12/2009		435	175	152	PASSED	I. SCIENTIF	10	12	7	10	
9/12/2009		435	167	152	PASSED	I. SCIENTIF	10	12	7	10	
9/12/2009		435	173	152	PASSED	I. SCIENTIF	9	12	7	10	
9/12/2009		435	150	152	NOT PASSE	I. SCIENTIF	7	12	7	10	
11/14/2009		435	159	152	PASSED	I. SCIENTIF	8	12	7	9	
11/14/2009		435	161	152	PASSED	I. SCIENTIF	10	12	7	9	
11/21/2009	005		262	262	PASSED	Scientific I	2	4	2	3	
3/13/2010		435	160	152	PASSED	I. SCIENTIF	11	12	8	11	
4/24/2010		435	160	152	PASSED	I. SCIENTIF	9	12	7	10	
4/24/2010		435	156	152	PASSED	I. SCIENTIF	7	12	7	10	
4/24/2010		435	135	152	NOT PASSE	I. SCIENTIF	6	12	7	10	
6/12/2010		435	159	152	PASSED	I. SCIENTIF	7	12	7	10	
9/18/2010		435	194	152	PASSED	I. SCIENTIF	11	12	7	10	
9/18/2010		435	168	152	PASSED	I. SCIENTIF	9	12	7	10	
9/18/2010		435	176	152	PASSED	I. SCIENTIF	10	12	7	10	
9/18/2010		435	181	152	PASSED	I. SCIENTIF	10	12	7	10	
9/18/2010		435	174	152	PASSED	I. SCIENTIF	9	12	7	10	
9/18/2010		435	156	152	PASSED	I. SCIENTIF	8	12	7	10	
1/15/2011		435	184	152	PASSED	I. SCIENTIF	10	12	7	10	
9/17/2011		435	182	152	PASSED	I. SCIENTIF	10	12	7	10	
11/12/2011		435	153	152	PASSED	I. SCIENTIF	8	12	8	11	
7/21/2012		435	178	152	PASSED	I. SCIENTIF	6	12	7	10	
10/18/2012		5435	170	152	PASSED	I. SCIENTIF	10	12	8	11	
4/29/2013	5435		140	152	NOT PASSE	I. SCIENTIF	6	12	7	10	

Content St	points Earned	Points Available	25th %ile	75th %ile		Content St	points Earned	Points Available	25th %ile	75th %ile	
II. THE PHY	28	48	22	33	III. THE LIFI	18	24	15	21	
II. THE PHY	37	48	22	33	III. THE LIFI	22	24	15	21	
II. THE PHY	31	48	22	33	III. THE LIFI	17	24	15	21	
II. THE PHY	23	48	21	35	III. THE LIFI	13	24	17	22	
II. THE PHY	38	48	21	35	III. THE LIFI	22	24	17	22	
II. THE PHY	25	48	21	35	III. THE LIFI	16	24	17	22	
II. THE PHY	38	48	21	32	III. THE LIFI	20	23	13	19	
II. THE PHY	27	48	28	39	III. THE LIFI	22	24	16	22	
II. THE PHY	39	48	28	39	III. THE LIFI	19	24	16	22	
II. THE PHY	33	48	23	34	III. THE LIFI	22	24	16	21	
II. THE PHY	31	48	21	31	III. THE LIFI	14	23	13	18	
II. THE PHY	25	48	21	31	III. THE LIFI	17	23	13	18	
II. THE PHY	30	48	21	31	III. THE LIFI	17	23	13	18	
II. THE PHY	23	48	21	31	III. THE LIFI	16	23	13	18	
II. THE PHY	23	48	22	32	III. THE LIFI	19	24	16	20	
II. THE PHY	23	48	22	32	III. THE LIFI	17	24	16	20	
Physical Sc	4	4	2	3	Life Scienc	4	4	2	3	
II. THE PHY	25	48	21	34	III. THE LIFI	19	24	16	21	
II. THE PHY	32	48	28	39	III. THE LIFI	21	24	16	21	
II. THE PHY	34	48	28	39	III. THE LIFI	20	24	16	21	
II. THE PHY	14	48	23	33	III. THE LIFI	14	24	15	20	
II. THE PHY	24	48	22	34	III. THE LIFI	17	23	13	18	
II. THE PHY	39	48	27	38	III. THE LIFI	24	24	15	21	
II. THE PHY	36	48	27	38	III. THE LIFI	19	24	15	21	
II. THE PHY	37	48	27	38	III. THE LIFI	20	24	15	21	
II. THE PHY	36	48	27	38	III. THE LIFI	24	24	15	21	
II. THE PHY	38	48	27	38	III. THE LIFI	23	24	15	21	
II. THE PHY	36	48	27	38	III. THE LIFI	13	24	15	21	
II. THE PHY	39	48	22	33	III. THE LIFI	19	23	13	18	
II. THE PHY	36	48	20	33	III. THE LIFI	18	23	13	18	
II. THE PHY	25	48	21	33	III. THE LIFI	21	24	16	21	
II. THE PHY	40	48	28	38	III. THE LIFI	22	24	16	21	
II. THE PHY	29	48	22	34	III. THE LIFI	19	24	17	21	
II. THE PHY	24	48	20	33	III. THE LIFI	11	24	14	20	

Content St	points Earned	Points Available	25th %ile	75th %ile		Content St	points Earned	Points Available	25th %ile	75th %ile
IV. THE EAI	21	24	12	18	V. SCIENCE		11	12	9	11
IV. THE EAI	14	24	12	18	V. SCIENCE		9	12	9	11
IV. THE EAI	18	24	12	18	V. SCIENCE		11	12	9	11
IV. THE EAI	21	24	13	18	V. SCIENCE		11	12	6	9
IV. THE EAI	20	24	13	18	V. SCIENCE		11	12	6	9
IV. THE EAI	17	24	13	18	V. SCIENCE		8	12	6	9
IV. THE EAI	16	24	11	17	V. SCIENCE		11	12	7	11
IV. THE EAI	17	24	13	19	V. SCIENCE		12	12	8	11
IV. THE EAI	17	24	13	19	V. SCIENCE		9	12	8	11
IV. THE EAI	18	24	12	18	V. SCIENCE		8	12	9	11
IV. THE EAI	20	24	10	17	V. SCIENCE		12	12	8	11
IV. THE EAI	17	24	10	17	V. SCIENCE		11	12	8	11
IV. THE EAI	18	24	10	17	V. SCIENCE		11	12	8	11
IV. THE EAI	11	24	10	17	V. SCIENCE		8	12	8	11
IV. THE EAI	18	24	12	17	V. SCIENCE		9	12	9	11
IV. THE EAI	19	24	12	17	V. SCIENCE		9	12	9	11
Earth & Sp	3	4	2	3						
IV. THE EAI	16	24	12	18	V. SCIENCE		9	12	6	9
IV. THE EAI	14	24	13	19	V. SCIENCE		9	12	8	11
IV. THE EAI	15	24	13	19	V. SCIENCE		6	12	8	11
IV. THE EAI	15	24	13	19	V. SCIENCE		10	12	9	11
IV. THE EAI	15	24	11	17	V. SCIENCE		10	12	8	11
IV. THE EAI	22	24	12	18	V. SCIENCE		12	12	7	11
IV. THE EAI	17	24	12	18	V. SCIENCE		10	12	7	11
IV. THE EAI	18	24	12	18	V. SCIENCE		11	12	7	11
IV. THE EAI	20	24	12	18	V. SCIENCE		10	12	7	11
IV. THE EAI	17	24	12	18	V. SCIENCE		8	12	7	11
IV. THE EAI	14	24	12	18	V. SCIENCE		11	12	7	11
IV. THE EAI	19	24	11	17	V. SCIENCE		8	12	8	11
IV. THE EAI	20	24	11	16	V. SCIENCE		9	12	7	11
IV. THE EAI	15	24	13	18	V. SCIENCE		4	12	5	9
IV. THE EAI	20	24	13	18	V. SCIENCE		10	12	8	11
IV. THE EAI	20	24	14	19	V. SCIENCE		10	12	6	10
IV. THE EAI	11	24	13	19	V. SCIENCE		6	12	6	9

Appendix B

Department and Retention Data

Colorado Mesa University Majors by Department

Department: Biology

Majors

			2008-09		2009-10		2010-11		2011-12		2012-13	
Degree	Code	Major	1st Major	All	1st Major	All	1st Major	All	1st Major	All	1st Major	All
AS	2411	Liberal Arts, Biology	75	88	100	110	112	132	100	129	93	120
PB	2955	Biology Prov Bacc					8	8	8	8	15	15
BS	3400	Biology, Pre-Teacher Ed							3	3	11	11
	3410	Biological Sciences-Biology	276	301	304	339	327	362	384	422	457	494
	3412	Biology, Teacher Certification	12	14	20	24	17	22	9	20	6	11
Grand Total			363	403	424	473	464	524	504	582	582	651

Minors

Code	Minor	2008-09	2009-10	2010-11	2011-12	2012-13
M400	Biology	10	10	13	21	15
M480	Forensics	9	9	6	6	17
Grand Total		19	19	19	27	32

Colorado Mesa University Degrees Awarded by Department

Department: Biology

			2008-09		2009-10		2010-11		2011-12		2012-13	
Degree	**Code**	**Major**	**1st Major**	**All**	**1st Major**	**All**	**1st Major**	**All**	**1st Major**	**All**	**1st Major**	**All**
AS	2411	Liberal Arts, Biology	5	5			4	4	10	10	4	4
BS	3410	Biological Sciences-Biology	30	30	40	40	34	34	34	34	42	42
	3412	Biology, Teacher Certification	1	1	4	4	1	1	4	4		
Subtotal			36	36	44	44	39	39	48	48	46	46
Grand Total			36	36	44	44	39	39	48	48	46	46

Colorado Mesa University Registrations and Student Credit Hours by Student Level

Department: Biology

		2008-09		2009-10		2010-11		2011-12		2012-13	
Subject	**Student Level**	**Enrolled**	**SCH**	**Enrolled**	**SCH**	**Enrolled**	**SCH**	**Enrolled**	**SCH**	**Enrolled**	**SCH**
BIOL	FR	1006	2056	1223	2484	1388	2814	1553	3161	1602	3233
	SO	1644	3511	1999	4287	2393	5133	2820	6028	3027	6389
	JR	732	1629	909	2007	1031	2341	1062	2313	1171	2611
	SR	958	2152	1027	2220	1170	2614	1352	3002	1395	3049
	Non-Deg	117	257	102	218	116	228	79	173	34	70
	PBL	7	17	21	47	26	56	21	49	25	49
Grand Total		4464	9622	5281	11263	6124	13186	6887	14726	7254	15401

Colorado Mesa University Registrations and Student Credit Hours by Course Level

Department: Biology

		2008-09		2009-10		2010-11		2011-12		2012-13	
Subject	**Course Level**	**Enrolled**	**SCH**	**Enrolled**	**SCH**	**Enrolled**	**SCH**	**Enrolled**	**SCH**	**Enrolled**	**SCH**
BIOL	100	2162	4338	2510	5090	2869	5771	3188	6432	3529	7049
	200	1697	3880	2112	4760	2522	5726	2693	6053	2751	6202
	300	370	858	324	673	449	992	570	1275	481	1089
	400	235	546	335	740	283	692	436	966	492	1058
	500+					1	5			1	3
Grand Total		4464	9622	5281	11263	6124	13186	6887	14726	7254	15401

Colorado Mesa University Credit Hour Production, AY 2008-09 through 2012-13

Department: Biology

			2008-09			2009-10		
Course	Title	Cr Hr	Sections	Enrolled	SCH	Sections	Enrolled	SCH
BIOL								
101	General Human Biology-GTSC1	3	14	669	2007	13	731	2193
101L	General Human Biol Lab-GTSC1	1	27	670	670	29	728	728
102	General Organismal Biol-GTSC1	3	4	91	273	3	128	384
	Plant/Anim Biodiversity-GTSC1	3						
102L	General Organism Bio Lab-GTSC1	1	6	92	92	6	126	126
	Plant/Anim Biodivers Lab-GTSC1	1						
105	Attri Living Systems-GTSC1	3	4	165	495	4	188	564
105L	Attri Living Syst Lab-GTSC1	1	8	156	156	8	178	178
106	Prin Of Animal Biology	3	2	85	255	2	96	288
106L	Prin Of Animal Biol Lab	1	4	80	80	4	89	89
107	Principles of Plant Biology	3	2	78	234	2	102	306
107L	Prin Plant Biology Lab	1	4	76	76	4	99	99
113	Outdoor Survival	3				1	45	135
196	Topics	1-3						
203	Human Nutrition	3	1	27	81	1	36	108
205	Health, Nutrition, Safety	3	1	10	30	1	12	36
208	Fund of Ecology & Evolution	3				2	38	114
208L	Fund of Ecol & Evol Lab	1				3	39	39
209	Human Anatomy and Physiology	3	12	499	1497	13	594	1782
209L	Human Anatomy & Physiology Lab	1	22	472	472	26	575	575
210	Human Anatomy/Physiology II	3	8	235	705	7	305	915
210L	Human Anat/Physiology II Lab	1	13	228	228	14	287	287
211	Ecosystem Biology	4				1	5	20
241	Pathophysiology	4	5	201	804	6	221	884
250	Intro/Medical Microbiology	3	1	13	39			
250L	Intro/Med Microbiol Lab	2	1	12	24			
301	Principles of Genetics	3	2	47	141	2	43	129
301L	Principles/Genetics Lab	1	2	42	42	2	43	43
302	Cellular Biology	3	1	9	27			
302L	Cellular Biology Laboratory	1	1	9	9			
310	Developmental Biology	3	1	18	54	1	14	42
310L	Developmental Bio Lab	2	1	17	34	1	13	26
315	Epidemiology	3	1	19	57			
320	Plant Systematics	3				1	7	21
321	Taxonomy of Grasses	2				1	5	10
321L	Taxonomy/Grasses Lab	2				1	5	10
331	Insect Biology	3						
331L	Insect Biology Lab	2						
332	Intro to Geog Info Systems	2	1	1	2	1	3	6
332L	Intro to Geo Info Sys Lab	1	1	1	1	1	3	3

Colorado Mesa University Credit Hour Production, AY 20

Department: Biology

Course	Title	Cr Hr	2010-11			2011-12		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
BIOL								
101	General Human Biology-GTSC1	3	13	889	2667	14	964	2892
101L	General Human Biol Lab-GTSC1	1	34	895	895	38	969	969
102	General Organismal Biol-GTSC1	3	2	119	357	2	79	237
	Plant/Anim Biodiversity-GTSC1	3						
102L	General Organism Bio Lab-GTSC1	1	5	117	117	5	80	80
	Plant/Anim Biodivers Lab-GTSC1	1						
105	Attri Living Systems-GTSC1	3	4	214	642	6	284	852
105L	Attri Living Syst Lab-GTSC1	1	9	206	206	12	274	274
106	Prin Of Animal Biology	3	2	113	339	2	130	390
106L	Prin Of Animal Biol Lab	1	5	108	108	6	125	125
107	Principles of Plant Biology	3	3	94	282	3	119	357
107L	Prin Plant Biology Lab	1	5	92	92	5	118	118
113	Outdoor Survival	3				1	46	138
196	Topics	1-3	1	22	66			
203	Human Nutrition	3	1	27	81	1	46	138
205	Health, Nutrition, Safety	3	1	14	42	1	14	42
208	Fund of Ecology & Evolution	3	2	50	150	2	57	171
208L	Fund of Ecol & Evol Lab	1	3	50	50	3	55	55
209	Human Anatomy and Physiology	3	14	660	1980	16	786	2358
209L	Human Anatomy & Physiology Lab	1	27	624	624	31	739	739
210	Human Anatomy/Physiology II	3	12	412	1236	12	381	1143
210L	Human Anat/Physiology II Lab	1	18	366	366	18	351	351
211	Ecosystem Biology	4				1	8	32
241	Pathophysiology	4	6	266	1064	7	256	1024
250	Intro/Medical Microbiology	3	1	27	81			
250L	Intro/Med Microbiol Lab	2	1	26	52			
301	Principles of Genetics	3	2	57	171	2	73	219
301L	Principles/Genetics Lab	1	2	51	51	3	62	62
302	Cellular Biology	3	1	24	72			
302L	Cellular Biology Laboratory	1						
310	Developmental Biology	3				1	27	81
310L	Developmental Bio Lab	2				1	27	54
315	Epidemiology	3	1	25	75			
320	Plant Systematics	3				1	8	24
321	Taxonomy of Grasses	2						
321L	Taxonomy/Grasses Lab	2						
331	Insect Biology	3	1	12	36			
331L	Insect Biology Lab	2	1	12	24			
332	Intro to Geog Info Systems	2	1	2	4	1	1	2
332L	Intro to Geo Info Sys Lab	1	1	2	2	1	1	1

Colorado Mesa University Credit Hour Production, AY 20

Department: Biology

Course	Title	Cr Hr	2012-13			5-Year Average		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
BIOL								
101	General Human Biology-GTSC1	3	14	1079	3237	14	866	2599
101L	General Human Biol Lab-GTSC1	1	41	1101	1101	34	873	873
102	General Organismal Biol-GTSC1	3				3	104	313
	Plant/Anim Biodiversity-GTSC1	3	2	86	258	2	86	258
102L	General Organism Bio Lab-GTSC1	1				6	104	104
	Plant/Anim Biodivers Lab-GTSC1	1	5	85	85	5	85	85
105	Attri Living Systems-GTSC1	3	7	305	915	5	231	694
105L	Attri Living Syst Lab-GTSC1	1	12	294	294	10	222	222
106	Prin Of Animal Biology	3	4	149	447	2	115	344
106L	Prin Of Animal Biol Lab	1	7	142	142	5	109	109
107	Principles of Plant Biology	3	4	141	423	3	107	320
107L	Prin Plant Biology Lab	1	6	146	146	5	106	106
113	Outdoor Survival	3				1	46	137
196	Topics	1-3	1	1	1	1	12	34
203	Human Nutrition	3	2	90	270	1	45	136
205	Health, Nutrition, Safety	3				1	13	38
208	Fund of Ecology & Evolution	3	2	83	249	2	57	171
208L	Fund of Ecol & Evol Lab	1	4	83	83	3	57	57
209	Human Anatomy and Physiology	3	16	776	2328	14	663	1989
209L	Human Anatomy & Physiology Lab	1	31	757	757	27	633	633
210	Human Anatomy/Physiology II	3	11	329	987	10	332	997
210L	Human Anat/Physiology II Lab	1	17	317	317	16	310	310
211	Ecosystem Biology	4				1	7	26
241	Pathophysiology	4	7	280	1120	6	245	979
250	Intro/Medical Microbiology	3	1	19	57	1	20	59
250L	Intro/Med Microbiol Lab	2	1	17	34	1	18	37
301	Principles of Genetics	3	2	56	168	2	55	166
301L	Principles/Genetics Lab	1	2	49	49	2	49	49
302	Cellular Biology	3	1	33	99	1	22	66
302L	Cellular Biology Laboratory	1				1	9	9
310	Developmental Biology	3				1	20	59
310L	Developmental Bio Lab	2				1	19	38
315	Epidemiology	3	1	23	69	1	22	67
320	Plant Systematics	3				1	8	23
321	Taxonomy of Grasses	2	1	7	14	1	6	12
321L	Taxonomy/Grasses Lab	2	1	7	14	1	6	12
331	Insect Biology	3	1	8	24	1	10	30
331L	Insect Biology Lab	2	1	8	16	1	10	20
332	Intro to Geog Info Systems	2	2	3	6	1	2	4
332L	Intro to Geo Info Sys Lab	1	2	3	3	1	2	2

Course	Title	Cr Hr	2008-09			2009-10		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
333	Marine Biology	3	1	18	54			
335	Invertebrate Zoology	3				1	15	45
335L	Invertebrate Zoology Lab	1				1	13	13
336	Fish Biology	3	1	22	66			
337	Criminalistics	3	1	7	21			
337L	Criminalistics Laboratory	1	1	7	7			
341	General Physiology	3	2	14	42	1	20	60
341L	General Physiology Lab	1	1	14	14	1	19	19
342	Histology	2	1	4	8			
342L	Histology Laboratory	2	1	4	8			
343	Immunology	3				1	10	30
343L	Immunology Laboratory	1				1	10	10
344	Forensic Molecular Biology	3	1	11	33			
344L	Forensic Molecular Biology Lab	1	1	11	11			
350	Microbiology	3	1	17	51	1	27	81
350L	Microbiology Laboratory	1	1	15	15	1	27	27
371L	Cell and Molecular Lab	3						
386	Intro to Science Education	3				1	4	12
387	Structured Research	1-3	10	15	36	6	10	20
395	Independent Study	2						
396	Topics	1-3	4	48	125	2	33	66
403	Evolution	3				1	5	15
405	Adv. Ecological Methods	3						
405L	Adv. Ecological Methods Lab	2						
406	Plant-Animal Interactions	3				1	9	27
407	Tropical Field Biology	5	2	9	45			
408	Desert Ecology	3	2	28	84			
409	Gross/Dev Human Anatomy	2						
409L	Gross/Dev Human Anat Lab	2						
411	Mammalogy	3				1	20	60
411L	Mammalogy Laboratory	1				1	20	20
412	Ornithology	3	1	16	48			
412L	Ornithology Laboratory	1	1	16	16			
413	Herpetology	3	1	11	33			
413L	Herpetology Laboratory	1	1	11	11			
414	Aquatic Biology	3				1	22	66
414L	Aquatic Biology Laboratory	1				1	21	21
415	Tropical Ecosystems	2				1	10	20
416	Ethology	3						
416L	Ethology Laboratory	1						
418	Wildlife Management	3				1	15	45
418L	Wildlife Field Techniques	2				1	14	28
421	Plant Physiology	3	1	8	24			
421L	Plant Physiology Laboratory	1	1	8	8			
423	Plant Anatomy	3				1	8	24

Course	Title	Cr Hr	2010-11			2011-12		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
333	Marine Biology	3	1	27	81			
335	Invertebrate Zoology	3				1	14	42
335L	Invertebrate Zoology Lab	1				1	12	12
336	Fish Biology	3				1	15	45
337	Criminalistics	3	1	11	33			
337L	Criminalistics Laboratory	1	1	11	11			
341	General Physiology	3	1	26	78	1	29	87
341L	General Physiology Lab	1	1	23	23	1	27	27
342	Histology	2				1	8	16
342L	Histology Laboratory	2				1	8	16
343	Immunology	3				1	16	48
343L	Immunology Laboratory	1						
344	Forensic Molecular Biology	3	1	9	27			
344L	Forensic Molecular Biology Lab	1	1	8	8			
350	Microbiology	3	1	30	90	1	28	84
350L	Microbiology Laboratory	1	1	27	27	1	28	28
371L	Cell and Molecular Lab	3	1	4	12			
386	Intro to Science Education	3				1	4	12
387	Structured Research	1-3	9	20	46	11	16	34
395	Independent Study	2	1	1	2			
396	Topics	1-3	4	67	119	8	166	381
403	Evolution	3	1	11	33			
405	Adv. Ecological Methods	3				1	9	27
405L	Adv. Ecological Methods Lab	2				1	9	18
406	Plant-Animal Interactions	3						
407	Tropical Field Biology	5	1	11	55			
408	Desert Ecology	3	1	19	57			
409	Gross/Dev Human Anatomy	2				2	44	88
409L	Gross/Dev Human Anat Lab	2				2	44	88
411	Mammalogy	3				1	14	42
411L	Mammalogy Laboratory	1				1	14	14
412	Ornithology	3	1	14	42			
412L	Ornithology Laboratory	1	1	14	14			
413	Herpetology	3	1	20	60			
413L	Herpetology Laboratory	1						
414	Aquatic Biology	3				1	8	24
414L	Aquatic Biology Laboratory	1				1	8	8
415	Tropical Ecosystems	2						
416	Ethology	3	1	12	36			
416L	Ethology Laboratory	1	1	12	12			
418	Wildlife Management	3				1	19	57
418L	Wildlife Field Techniques	2				1	19	38
421	Plant Physiology	3	1	19	57			
421L	Plant Physiology Laboratory	1	1	18	18			
423	Plant Anatomy	3				1	6	18

Course	Title	Cr Hr	2012-13			5-Year Average		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
333	Marine Biology	3	1	30	90	1	25	75
335	Invertebrate Zoology	3				1	15	44
335L	Invertebrate Zoology Lab	1				1	13	13
336	Fish Biology	3				1	19	56
337	Criminalistics	3	1	10	30	1	9	28
337L	Criminalistics Laboratory	1	1	9	9	1	9	9
341	General Physiology	3	1	24	72	1	23	68
341L	General Physiology Lab	1	1	23	23	1	21	21
342	Histology	2				1	6	12
342L	Histology Laboratory	2				1	6	12
343	Immunology	3				1	13	39
343L	Immunology Laboratory	1				1	10	10
344	Forensic Molecular Biology	3	1	7	21	1	9	27
344L	Forensic Molecular Biology Lab	1	1	6	6	1	8	8
350	Microbiology	3	1	30	90	1	26	79
350L	Microbiology Laboratory	1	1	29	29	1	25	25
371L	Cell and Molecular Lab	3	1	8	24	1	6	18
386	Intro to Science Education	3				1	4	12
387	Structured Research	1-3	15	32	61	10	19	39
395	Independent Study	2				1	1	2
396	Topics	1-3	5	76	172	5	78	173
403	Evolution	3	1	6	18	1	7	22
405	Adv. Ecological Methods	3				1	9	27
405L	Adv. Ecological Methods Lab	2				1	9	18
406	Plant-Animal Interactions	3	1	7	21	1	8	24
407	Tropical Field Biology	5				2	10	50
408	Desert Ecology	3	1	22	66	1	23	69
409	Gross/Dev Human Anatomy	2	2	57	114	2	51	101
409L	Gross/Dev Human Anat Lab	2	4	56	112	3	50	100
411	Mammalogy	3				1	17	51
411L	Mammalogy Laboratory	1				1	17	17
412	Ornithology	3				1	15	45
412L	Ornithology Laboratory	1				1	15	15
413	Herpetology	3	1	17	51	1	16	48
413L	Herpetology Laboratory	1	1	17	17	1	14	14
414	Aquatic Biology	3				1	15	45
414L	Aquatic Biology Laboratory	1				1	15	15
415	Tropical Ecosystems	2	1	11	22	1	11	21
416	Ethology	3	1	10	30	1	11	33
416L	Ethology Laboratory	1	1	8	8	1	10	10
418	Wildlife Management	3				1	17	51
418L	Wildlife Field Techniques	2				1	17	33
421	Plant Physiology	3	1	22	66	1	16	49
421L	Plant Physiology Laboratory	1	1	20	20	1	15	15
423	Plant Anatomy	3				1	7	21

Course	Title	Cr Hr	2008-09			2009-10		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
423L	Plant Anatomy Laboratory	2				1	8	16
425	Molecular Genetics	3				1	8	24
426	Intro to Electron Microscopy	2						
426L	Intro to Electron Micro Lab	2						
431	Animal Parasitology	3				1	7	21
431L	Animal Parasitology Lab	1				1	7	7
433	Marine Invert Communities	3						
441	Endocrinology	3	1	19	57	1	18	54
441L	Endocrinology Laboratory	1	1	19	19	1	18	18
442	Pharmacology	3	1	13	39	1	11	33
450	Mycology	2				1	10	20
450L	Mycology Laboratory	2				1	8	16
482	Senior Research	2						
483	Senior Thesis	2	4	41	82	4	37	74
487	Advanced Research	1-3	4	5	14	3	6	17
493	Lab Teaching Practicum	1						
495	Independent Study	1-3	5	13	17	5	9	14
496	Topics	2-3	1	11	33	2	38	91
499	Internship	1-*	5	7	16	6	6	9
507	Tropical Field Biology	5						
533	Marine Invertebrate Communitie	3						
BIOL Total			209	4464	9622	217	5281	11263
Grand Total			**209**	**4464**	**9622**	**217**	**5281**	**11263**

Course	Title	Cr Hr	2010-11			2011-12		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
423L	Plant Anatomy Laboratory	2				1	6	12
425	Molecular Genetics	3				1	9	27
426	Intro to Electron Microscopy	2	1	7	14			
426L	Intro to Electron Micro Lab	2	1	7	14			
431	Animal Parasitology	3				1	14	42
431L	Animal Parasitology Lab	1				1	14	14
433	Marine Invert Communities	3						
441	Endocrinology	3	1	24	72	1	18	54
441L	Endocrinology Laboratory	1						
442	Pharmacology	3	1	16	48	1	19	57
450	Mycology	2				1	23	46
450L	Mycology Laboratory	2				1	23	46
482	Senior Research	2						
483	Senior Thesis	2	4	39	78	4	38	76
487	Advanced Research	1-3	2	4	11	4	10	26
493	Lab Teaching Practicum	1	2	3	3	2	11	11
495	Independent Study	1-3	4	8	11	3	3	5
496	Topics	2-3	1	16	32	2	39	78
499	Internship	1-*	7	9	25	11	15	50
507	Tropical Field Biology	5	1	1	5			
533	Marine Invertebrate Communitie	3						
BIOL Total			238	6124	13186	273	6887	14726
Grand Total			**238**	**6124**	**13186**	**273**	**6887**	**14726**

Course	Title	Cr Hr	2012-13			5-Year Average		
			Sections	Enrolled	SCH	Sections	Enrolled	SCH
423L	Plant Anatomy Laboratory	2				1	7	14
425	Molecular Genetics	3				1	9	26
426	Intro to Electron Microscopy	2	1	10	20	1	9	17
426L	Intro to Electron Micro Lab	2	1	10	20	1	9	17
431	Animal Parasitology	3				1	11	32
431L	Animal Parasitology Lab	1				1	11	11
433	Marine Invert Communities	3	1	11	33	1	11	33
441	Endocrinology	3				1	20	59
441L	Endocrinology Laboratory	1				1	19	19
442	Pharmacology	3	1	26	78	1	17	51
450	Mycology	2				1	17	33
450L	Mycology Laboratory	2				1	16	31
482	Senior Research	2	1	1	2	1	1	2
483	Senior Thesis	2	5	49	98	4	41	82
487	Advanced Research	1-3	9	9	15	4	7	17
493	Lab Teaching Practicum	1	16	23	23	7	12	12
495	Independent Study	1-3	5	6	8	4	8	11
496	Topics	2-3	4	81	179	2	37	83
499	Internship	1-*	11	13	37	8	10	27
507	Tropical Field Biology	5				1	1	5
533	Marine Invertebrate Communitie	3	1	1	3	1	1	3
BIOL Total			311	7254	15401	250	6002	12840
Grand Total			**311**	**7254**	**15401**	**250**	**6002**	**12840**

Colorado Mesa University Credit Hours by Faculty Type

Department: Biology

		2008-09			2009-10			2010-11		
Subject	Faculty Type	CCH	SCH	% SCH	CCH	SCH	% SCH	CCH	SCH	% SCH
BIOL	1 -T/TT	272	6446	67%	268	7384	66%	254	6504	49%
	3 -FT NonTT	59	1599	17%	57	2084	19%	84	3002	23%
	5 -Admin/Coaches									
	6 -PT	83	1577	16%	85	1795	16%	119	3680	28%
BIOL Total		414	9622	100%	410	11263	100%	457	13186	100%

Colorado Mesa University Credit Hours by Fa

Department: Biology

		2011-12			2012-13		
Subject	**Faculty Type**	**CCH**	**SCH**	**% SCH**	**CCH**	**SCH**	**% SCH**
BIOL	1 -T/TT	275	6530	44%	308	7180	47%
	3 -FT NonTT	114	4242	29%	154	5012	33%
	5 -Admin/Coaches				3	63	0%
	6 -PT	138	3954	27%	106	3146	20%
BIOL Total		527	14726	100%	571	15401	100%

Colorado Mesa University Ratio of full-time equivalent students (FTES) to Full-time equivalent faculty (FTEF)

Department: Biology

	2008-09			2009-10			2010-11		
Subject	**FTES**	**FTEF**	**FTES:FTEF**	**FTES**	**FTEF**	**FTES:FTEF**	**FTES**	**FTEF**	**FTES:FTEF**
BIOL	320.7	17.3	18.6	375.4	17.1	22.0	439.5	19.0	23.1
Grand Total	**320.7**	**17.3**	**18.6**	**375.4**	**17.1**	**22.0**	**439.5**	**19.0**	**23.1**

2011-12			2012-13		
FTES	FTEF	FTES:FTEF	FTES	FTEF	FTES:FTEF
490.9	22.0	22.4	513.4	23.8	21.6
490.9	**22.0**	**22.4**	**513.4**	**23.8**	**21.6**

Colorado Mesa University Biology Majors in Fall 2011 and 2012
with status the subsequent fall

				Status the Following Fall							
				Graduated		Retained in Biology		department		Not Retained	
Fall	Degree Level	Class Standing	Total %	#	%	#	%	#	%	#	%
2011	Associate	FR	50	0	0%	22	44%	2	4%	26	52%
		SO	46	2	4%	31	67%	3	7%	10	22%
	Bachelors	FR	88	0	0%	43	49%	10	11%	35	40%
		SO	80	0	0%	46	58%	7	9%	27	34%
		JR	68	0	0%	51	75%	4	6%	13	19%
		SR	118	36	31%	62	53%	3	3%	17	14%
2012	Associate	FR	44	0	0%	16	36%	4	9%	24	55%
		SO	51	0	0%	24	47%	6	12%	21	41%
	Bachelors	FR	104	0	0%	55	53%	18	17%	31	30%
		SO	100	0	0%	65	65%	8	8%	27	27%
		JR	78	2	3%	52	67%	6	8%	18	23%
		SR	138	39	28%	76	55%	4	3%	19	14%

Appendix C

Faculty Curriculum Vitae

CURRICULUM VITAE

Margot C. Becktell, Ph.D.
Department of Biological Sciences
Colorado Mesa University
Grand Junction, Colorado 81501
970-248-1892
mbecktel@coloradomesa.edu

EDUCATION

Ph.D. in Plant Pathology, Cornell University, 2005
Minors: Plant Physiology and Horticulture
Dissertation: The Host-Pathogen Interactions and Epidemiological Implications of the *Petunia* x *hybrida*, *Calibrachoa* x *hybridus* and *Nicotiana benthamiana* Late Blight Systems

B.S. Biology with a minor in Chemistry, Mesa State College, 1998 (magna cum laude)

TEACHING

Teaching Experience:

2008 – Present: Assistant Professor of Biology
Department of Biological Sciences, Colorado Mesa University, Grand Junction, CO

2005 - 2008: Lecturer of Biology
Department of Biological Sciences, Mesa State College, Grand Junction, CO

2001: Graduate teaching assistant
Department of Plant Pathology, Cornell University, Ithaca, NY
Plant Pathology 241 Lab: Plant diseases and disease management
Received "Golden Apple" teaching award - outstanding teaching assistant, 2001-2002 academic year

Traditional Classroom Courses Taught and Experiential Courses Supervised:

SUPP 101 (FYI) Introduction to Higher Education
BIOL 101, 101L General Human Biology
BIOL 105, 105L Attributes of Living Systems
BIOL 107, 107L Principals of Plant Biology
BIOL 387 Structured Research
BIOL 395 Independent Study
BIOL 396 Topics: Horticulture
BIOL 421, 421L Plant Physiology
BIOL 423, 432L Plant Anatomy
BIOL 450, 450L Mycology
BIOL 482 Senior Research
BIOL 483 Senior Thesis
BIOL 487 Advanced Research
BIOL 493 Lab Teaching Practicum
BIOL 495 Independent Study
BIOL 499 Internship

Innovative Teaching Materials/Activities:

- "Unknown Plant" group projects and poster presentations in Principles of Plant Biology Lab (BIOL 107L)
- Plant life cycle drawing assignments in Principles of Plant Biology Lecture and the "Botany Wall of Fame" (BIOL 107)
- Community interview projects and presentations in Horticulture topics course (BIOL 396)
- Student driven projects/experiments in Plant Physiology Lab (BIOL 421L)
- Local mycological collection assignment in Mycology Lab (BIO 450L)

Evidence of Continuous Improvement:

January 10-11, 2013: Paul Gaston, Kent State University
General Education Workshop

August 15-16, 2012: Ken Bain
"What all the Best Professors Do" teaching workshop

January 5 - 6, 2012: Paul Gaston, Kent State University
The Degree Qualifications Profile

May 20, 2011: Cengage Learning
SUP 101/FYI workshop/training sessions

October 18, 2011: Sonia Brandon, Colorado Mesa University
Learning and Study Strategies Inventory (LASSI) Implementation

January 13 - 14, 2011: Jessica Herrick, Colorado Mesa University
Revitalizing General Education and Program Assessment

May 21, 2010: Cengage Learning
SUP 101/FYI workshop/training session

January 15 - 16, 2009: Barbara Millis, University of Nevada - Las Vegas
Linking Classroom Assessment Techniques to the Research on How People Learn
Using Groups and Academic Games for Learning and Assessment
Course Redesign Revitalization

May 19, 2009: Nancy Conklin and Kristyn Rose, Mesa State College
Universal Design for Learning workshop.

May 22, 2009: Cengage Learning
Supp 101/FYI workshop/training session

May 1 - 2, 2008: Ed Neal, University of North Carolina
Designing Courses that Promote Critical Thinking
Teaching Critical Thinking: Active Learning
Evaluating Critical Thinking
Classroom Management: Dealing with Difficulties

October 21, 2008: "How to Create an Inclusive Environment: It all begins with you!"
Seminar on diversity in the workplace

Fall 2008
Faculty colloquium on use of i>clickers in the classroom

RESEARCH AND SCHOLARLY ACTIVITIES

Research Experience:

2009-Present: Undergraduate Research Mentor
Colorado Mesa University

2005 – 2012: Research Associate
Colorado Department of Agriculture's Insectary, Palisade, Colorado

1999 – 2004: Graduate Research Assistant; Ph.D. Candidate
Department of Plant Pathology, Cornell University, Ithaca, NY

1998: Undergraduate Research Assistant
Biology and Chemistry Departments, Mesa State College, Grand Junction, CO

1998: Undergraduate Research Assistant
La Selva Biological Research Station, Costa Rica

Research Projects and Undergraduate Students Mentored at Colorado Mesa University:

Fall 2011-Present: Continuation of dissertation research to identify a zoospore lysing substance produced by petunias infected with *Phytophthora infestans.*
Undergraduate Research Students: Emily Breiner, Jessica Hartney, Kiley DeSanto, Nathan Stevenson

Spring 2011: Optimization of *Puccinia acroptili* inoculum production under growth chamber conditions.
Undergraduate Research Student: Katherine Sams

Spring 2011: FulvicBloom™/Bio- Microbial Bloom™ foliar application comparison experiment on Micro-Tom tomatoes.
Undergraduate Research Student: James Crass

Summer 2011: Analysis of Brix levels in sugar beet cotyledons in response to fulvic acid applications using Fulvic Bloom™.
Undergraduate Research Student: Chris Reinertsen

Summer 2011: Determination of the effectiveness of the rust fungus *Puccinia acroptili* as a potential biological control for the invasive species *Acroptilon repens* (Russian knapweed) under field conditions at the Horsethief Bench area.
Undergraduate Research Student: Jessica Hartney

Spring-Summer 2009: Determination of the pathogenicity of a naturally occurring isolate of the soil-borne pathogen *Rhizoctonia* on greenhouse grown *Euphorbia esula* (Leafy Spurge), a noxious, invasive weed in Colorado.
Undergraduate Research Student: Alex Randolph-Lowe

Peer-Reviewed Publications:

Bruckart, III, W. L., Eskandary, F. M., Becktell, M. C., Bean, D., Littlefield, J., Pilgeram, A.L., Sands, D. C., Aime, M.C. 2006. *Puccinia acroptili* on Russian knapweed in Colorado, Montana, and Wyoming. Plant Disease 90:971.

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. 2005. Epidemiology and management of petunia and tomato late blight in the greenhouse. Plant Disease 89:1000-1008.

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. 2005. Temperature and leaf wetness requirements for pathogen establishment, incubation period and sporulation of *Phytophthora infestans* on *Petunia x hybrida*. Plant Disease 89:975-979.

Becktell, M. C., Smart, C. D., Haney, C. H. and Fry, W. E. 2005. Host- pathogen interactions between *Phytophthora infestans* and the solanaceous hosts *Calibrachoa x hybridus*, *Petunia x hybrida* and *Nicotiana benthamiana*. Plant Disease 90:24-32.

Published Abstracts:

Becktell, M. C. and Fry, W. E. 2012. Zoospore lysis occurs in sporangial suspensions made from petunia late blight lesions.
http://www.apsnet.org/meetings/Documents/2012_Meeting_Abstracts/aps12abP98.htm

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. 2003. Temperature and moisture requirements for establishment, incubation period, latent period and sporulation of *Phytophthora infestans* on petunia. Phytopathology 93(6):S7.

Rathbone*, M.C., Smart, C. D and Fry, W. E. 2001. Isolates of *Phytophthora infestans* that infect *Petunia* × *hybrida* and *Nicotiana benthamiana* also produce INF1. Phytopathology 92(6): S145.
* Maiden name

Online Publications:

Online Guide to the Flora of Mesa County/Flora Database
Co-authored with Dr. Deb Kennard, Dr. Carrie McVean Waring, Dr. Kristy Duran
http://www.coloradomesa.edu/flora/index.html

Trade Journal Articles:

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. 2003. Beware of Late Blight on Petunias and Tomatoes. Greenhouse Business. June 2003: 31-32

Daughtrey, M. and Becktell, M. 2002. Scary *Phytophthoras*. Grower Talks. September 2002: 90, 92.

Extension Publications:

Becktell, M. C., Daughtrey, M. L. and Fry, W. E. (2002). Petunia late blight, an emerging disease? Focus on Floriculture, Cornell University. Volume 1, No. 2

Presentations and Posters:

2013: Undergraduate research poster presentation by Jessica Hartney and Nathan Stevenson at the CMU Student Showcase. Poster titled "Investigations into a zoospore lysing agent made from petunia late blight lesions". AWARDED first place for poster session.

2012: Poster presentation at the 2012 annual meeting of the American Phytopathological Society titled "Zoospore Lysis Occurs In Sporangial Suspensions Made From Petunia Late Blight Lesions".

2008: Presentation of research on biological control of leafy spurge at the Upper Colorado Environmental Plant Center Training Session in Meeker, Colorado.

2003: Poster presented to the American Floral Endowment at the Long Island Horticultural Research and Extension Center at the 2003 "Cornell Floriculture Open House and Field Day" titled "Petunia late blight a Typhoid Mary?"

2003: Presentation at the annual meeting of the American Phytopathological Society titled "Temperature and moisture requirements for establishment, incubation period, latent period and sporulation of *Phytophthora infestans* on petunia."

2003: Presentation at the Ohio Florists' Association Short Course titled "Late blight – beware the petunias".

2001: Presentation at the annual meeting of the Northeast Division of the American Phytopathological Society entitled "Isolates of *Phytophthora infestans* that infect *Petunia x hybrida* and *Nicotiana benthamiana* also produce INF1."

Grant/Funding Proposals:

January, 2014. Co-PI on NSF-MRI Proposal to fund the purchase of an ELSD LC-MS system. PI Dr. Kimberly White, CMU Chemistry Department. In progress.

September, 2013. Colorado Mesa University Faculty Professional Development Proposal for purchase of equipment and supplies to perform Glucose phosphate isomerase isozyme analysis of *Phytophthora infestans* isolates being maintained in my research lab. $1,618 requested. FUNDED

September, 2013. CMU Department of Biological Sciences Undergraduate Research Fund Proposal for purchase of supplies to perform Glucose phosphate isomerase (GPI) isozyme analysis of *Phytophthora infestans* isolates being maintained in my research lab. $379 requested. FUNDED (an additional $740 requested and funded to cover an item that was misquoted from Helena Labs for running GPI gels).

September, 2013. Colorado Mesa University Faculty Professional Development Proposal for travel to the 2014 annual meeting of the American Phytopathological Society. $1,355.00 requested. $1,084.00 FUNDED

October, 2013. CMU Department of Biological Sciences Travel funds to travel to the 2014 annual meeting of the American Phytopathological Society. $1,355 requested. $1,200 FUNDED

September, 2011. Colorado Mesa University Faculty Professional Development Proposal for purchase of a 9 cu. ft. growth chamber to maintain research cultures of *Phytophthora infestans*. $3,000 requested. FUNDED

September, 2011 Colorado Mesa University Faculty Professional Development Proposal for travel to the 2011 annual meeting of the American Phytopathological Society. $1,655 requested. $1,241 FUNDED

September, 2011. CMU Department of Biological Sciences Undergraduate Research Fund Proposal for purchase of supplies to grow and maintain isolates of *Phytophthora infestans*. $394 requested. FUNDED

Grant/Funding Proposals:

September, 2010 Mesa State College Faculty Professional Development Proposal for continued work on "Flora of Mesa County". $2,400 requested. $2,040 FUNDED

September, 2009 Mesa State College Faculty Professional Development Proposal for development of a "Flora of Mesa County" website. $3,000 requested. FUNDED

September, 2009 NSF-S-STEM scholarship program proposal to encourage student success in biological Sciences at MSC titled "Students Mentoring Students in Biology Scholarship Program. $165,000 requested. Not Funded

September, 2007 White River Habitat Partnership Program (Rio Blanco County, Colorado) proposal entitled "Development and implementation of a biologically based management plant for leafy spurge in Colorado". $10,000 requested. FUNDED

January 12, 2007 EPA grant proposal entitled "Optimizing the biological control of leafy spurge in Colorado through an integrated pest management program". $50,900. Not Funded

January 23, 2007 USDA-NRCS-CIG grant proposal title "Development and implementation of a biologically based management plant for leafy spurge in Colorado". $201,631. FUNDED

Internships and Independent Study Projects:

Spring 2006 -Spring 2009, Fall 2010- Present: Greenhouse Management and Curation Internship or Independent Study. Two students per semester including one for most summers (gap due to construction of new greenhouse). Supervision of 33 students to date.

Spring-Summer 2011: Flora of Mesa County Website development.
Undergraduate Students Supervised: Cambri Crow and Lorraine Cooper

Manuscripts Reviewed:

January, 2014 Review of Weed Research Manuscript ID WRE-2013-0226. Does *Fusarium* –caused seed mortality contribute to *Bromus tectorum* stand failure in the Great Basin? Meyer, S., Franke, J., Baughman, O., Beckstead, J., and Geary, B.

June, 2008 Review of Plant Disease Manuscript ID PD-03-08-0134-RE. Identification of *Phytophthora cryptogea* as the cause of Rapid Decline of Petunia in Chile. Latorre.

October, 2007 Second Review of Plant Disease Manuscript ID PD-09-06-0485-RE.R2. The Host Specificity and Tomato-related Race Composition of *Phytophthora infestans* Isolates in Taiwan During 2004 to 2005. Chen.

April, 2006 Reviewed Plant Disease Note ID PD-04-06-0208-PDN. First report of *Phytophthora infestans* on *Petunia* × *hybrida* in South Africa. McLeod, A.

September, 2006 Reviewed Plant Disease Manuscript ID PD-09-06-0485-RE. The Host Specificity and Tomato-related Race Composition of *Phytophthora infestans* Isolates in Taiwan During 2004 to 2005. Chen.

Professional Memberships:

- American Phytopathological Society
- American Horticulture Society
- Botanical Society of America
- Association of Education and Research Greenhouse Curators
- Tri-Beta Honor Society

SERVICE

Campus Committees:

Spring 2013 – Present: Member of Biology Department subcommittee to develop tracks/concentrations within the Biology program.

Spring/Fall 2013 – Present: Member of Biology Department subcommittee to develop discipline specific student learning outcomes (SLOs)

Fall 2012 – Present: Academic Policies Committee Member

Spring 2012: Grade Appeals Ad Hoc Committee Member

Fall 2008 – Spring 2012: Faculty Salary and Benefits Committee Member

Spring 2009 - Spring 2012: Curriculum Committee Member

Fall 2008 - Lectures and Forums Committee Member

Search Committees:

Spring 2014: Biology Teaching Laboratory Technician Search Committee Member

Fall 2012: Academic Advisor Search Committee Member

Fall 2011 - Spring 2012 - Assistant Professor of Biology: Developmental Biology Search Committee Member

Fall 2010-Spring 2011: Assistant Professor of Biology: Botany Search Committee Chair

Summer 2009: Academic Advisor Search Committee Member

Spring 2008: Medical Surgical Nursing Search Committee Member

Service to Colorado Mesa University:

Spring 2013 – Present: Active member of the CMU Tree Advisory Committee to establish CMU as a Tree Campus USA.

Spring 2011-Spring 2012: Partnered with Dr. Aparna Palmer to initiate and help with activities to name the herbarium at CMU the "Walter Almond Kelley Herbarium".

Fall 2008: Student Recruitment Day

Service to Colorado Mesa University:

2006 – Present: Manager/Curator of the Wubben Science educational greenhouse facility.

Spring 2005: Moderator for a morning oral presentation session for the Student Scholars Program

Service to Department of Biological Sciences, Colorado Mesa University:

Spring 2012: Coordinated meeting over spring break to draft departmental Student Learning Outcomes (SLOs)

2011: Coordinated and wrote report for the BIOL 101 General Education Assessment

2010: Coordinated and wrote report for the BIOL 101 General Education Assessment

2009 - Present: Wubben Science Courtyard Committee Member

2008 - Present: Biology Travel Committee Member

2007: Coordinated and wrote reports for BIOL 101 General Education Assessment

2006: Coordinated and wrote reports for BIOL 101 General Education Assessment

Service to the Community:

Fall 2012: Met with and gave Jeff Nichols, from Mesa Developmental Services, a tour of the greenhouse; discussed options for expansion of the Western Colorado Botanical Gardens.

Fall 2012: Hosted a field trip to and activity day in the Wubben Science greenhouse facility by the two kindergarten classes from Independence Academy Charter School (40 children).

Fall 2012: Helped organize a talk by invited speaker Kathy Doeskin. "Health, Wealth and Compost: Completing the Circle". Co-sponsored by the CMU Sustainability Council and the CMU Department of Biological Sciences.

Fall 2012: Composed a letter of support on behalf of myself, Dr. Stephen Stern and Dr. Deborah Kennard for the proposed arboretum project at Lincoln Park.

Fall 2012: Volunteered to introduce and describe, on video, a tree for the Lincoln Park Arboretum audio/visual tour project. My assigned tree was the Frontier Elm, *Ulmus 'Frontier'*.

Spring 2012: Tour of Wubben Science Greenhouse for the Native Plant Society.

Spring 2012: Finals judge for The Western Colorado Science Fair.

November, 2010: Organized travel for and talk by Dr. Mary Beth Hughes from the Science and Technology Policy Institute. "The Science and Policy of Personalized Medicine". Sponsored by the MSC Chapter of Sigma Xi.

April, 2010: Organized travel for and talk by Dr. Bruce Bugbee from Utah State University. "Living in Space: NASA's Research on Biological Life Support". Co-sponsored by the W. Colorado Math and Science Center, The Colorado Space Grant Consortium, The MSC Chapter of Sigma Xi and the Tri-Beta Honor Society.

Service to the Community:

February, 2010: Organized travel for and talk by NASA scientist, Mr. David Mains. "Manned Space Flight, Future or Fantasy?". Co-sponsored by the W. Colorado Math and Science Center, the Colorado Space Grant Consortium, and the MSC Chapter of Sigma Xi.

September 13, 2011: Women in Technology, Science and Math Panel Discussion member at the September meeting of the American Association of University Women held in the University Center.

May 24, 2011: Colorado Canyons Association Nature Scavenger Hunt at Devils Canyon - volunteered as the "Cottonwood Station" person for the morning session; gave a brief talk to groups of third graders and handed out scavenger hunt cards.

March 24, 2010: "Plants and Soils" presentation/activity for Scenic Elementary School second graders at the Math and Science Center.

Fall 2009: Served as a judge for the Renewable Energy Category of the Conrad Spirit of Innovation Awards Contest; Judged Team "Ramana's"; "GoSolar" system to gather solar energy in residential and agricultural areas.

Fall 2009- Spring 2010: Adult Science Fair Sponsor for two Grand Junction High School students (Kelsey Slauson and Kenna Brown). Helped them develop a project and supervised some of their experimental work here on campus.

Fall 2009: Attended and served as a consultant at an informational meeting at Grand Junction High School (Ms. Mara McDougal's science class) regarding potential construction of a greenhouse on the high school grounds.

2008, 2010, 2011, facilitated MSC/CMU reservation and organization activities related to the annual Saccomano Lectures co-sponsored by St. Mary's Hospital and the MSC/CMU Chapter of Sigma Xi.

2005, 2006, 2008: Preliminaries judge for the "Botany" category at The Western Colorado Science Fair.

Service to Professional Organizations:

January 2007 - Present: Senior Editor for Plant Health Instructor, an online resource of plant disease lessons, lab exercises, articles, cases studies and simulations for teachers and professors hosted by the American Phytopathological Society.

Fall 2009 - Spring 2011: President MSC/CMU Chapter of the Sigma Xi Honor Society

Fall 2006-Spring 2009: Vice President MSC Chapter of the Sigma Xi Honor Society

Professional Committees and Activities Prior to Employment at CMU:
2003: APS* Placement Committee
2003: APS* Young Professionals Ad Hoc Committee
2002: Plant Pathology Seminar Committee, Cornell University
2001-2003: New Student Coordinating Committee, Cornell University
2001: Secretary, Cornell Plant Pathology Graduate Student Association
2000: Co-Chair, Cornell Plant Pathology Graduate Student Association
2000: Chair, Cornell Plant Pathology Graduate Student Colloquium
1995-1997: Vice President, Epsilon Omicron Chapter (MSC Chapter), Tri-Beta Biological Honor Society
* APS = American Phytopathological Society

ADVISING

2013
Freshman Orientation Advising Sessions: 2
Individual Advising Sessions: 59
Letters of Recommendation: 11

2012 Freshman Orientation Advising Sessions: 3
Individual Advising Sessions: 43
Letters of Recommendation: 7

2011
Freshman Orientation Advising Sessions: 2
Individual Advising Sessions: 31
Letters of Recommendation: 6

2010
Freshman Orientation Advising Sessions: 3
Individual Advising Sessions: 27
Letters of Recommendation: 6

2009
Freshman Orientation Advising Sessions: 4
Individual Advising Sessions: 16
Letters of Recommendation: 7

2008
Freshman Orientation Advising Sessions: 3
Individual Advising Sessions: 13
Letters of Recommendation: 2

2007
Freshman Orientation Advising Sessions: 1
Letters of Recommendation: 1

2006
Freshman Orientation Advising Sessions: 1
Letters of Recommendation: 11

2005
Freshman Orientation Advising Sessions: 1

Honors and Awards

Spring 2013: "Faculty Advisor of the Year" 2013 Maverick Award

Honors, Awards and Minor Grants Prior to Employment at CMU

2003: Travel Grant, Cornell University, Ithaca, NY
2003: Thesis Research Grant from The Fred C. Gloeckner Foundation, Inc.
2003: APS Foundation Student Travel Award
2002: Thesis Research Grant from The Fred C. Gloeckner Foundation, Inc.
2001: Travel Grant, Cornell University, Ithaca, NY
2001: Outstanding Teaching Assistant Award, Cornell University, Ithaca, NY
1999 – 2004: Graduate Research Assistantship, Dept. of Plant Pathology, Cornell University, Ithaca, NY
1994, 1997: President's Scholar, Mesa State College, Grand Junction, CO
1995: Scholarship from the American Association of University Women – Amy Lutz Rechel Scholarship.
1993, 96, 97, and 98: Dean's List, Mesa State College, Grand Junction, CO
1993 – 1998: Academic Scholarship, Mesa State College, Grand Junction, CO

KELLY JEAN THOMAS CRAIG

Professional address: Saccomanno Research Institute
St. Mary's Hospital and Regional Medical Center
2525 N. 8th St, Suite 106, Grand Junction, CO 81502
Tel: 970-298-6243
Email: kelly.craig@stmarygj.org

Personal Address: 695 Glen Caro Dr, Grand Junction, CO 81506
Tel: 970-261-3366
Email: n2research@yahoo.com

Date of Birth: January 28th, 1982 - **Nationality:** American - **Language:** English

"seeking tenure-track biology faculty position, drawing on my research experience, to supplement textbook curriculum with cutting-edge knowledge in the field"

A. Education

2005-2009	Ph.D. Biochemistry and Molecular Biology, Georgetown University, Washington, DC
2007-2009	Teaching Certificate, Center for New Designs in Learning & Scholarship, Georgetown University, Washington, DC
2000-2004	B.S. Genetics, University of Kansas, Lawrence, KS

B. Positions, Honors and Leadership

POSITIONS

2012-current	Research Scientist, Laboratory of Cancer Biology under Dr. Marty R. Jacobson, Saccomanno Research Institute, St. Mary's Hospital, Grand Junction, CO
2011-2012	Keystone Symposia Fellow in Molecular and Cellular Biology http://www.keystonesymposia.org/AboutUs/Diversity_Fellows.cfm
2009-current	Adjunct Faculty Member, Biology Department, Colorado Mesa University, Grand Junction, CO http://coloradomesa.edu/biology/faculty.html
2009-2011	Postdoctoral Fellow, Laboratory of Cancer Biology under Dr. Marty R. Jacobson, Saccomanno Research Institute, St. Mary's Hospital, Grand Junction, CO http://www.stmarygj.org/kelly-jean-thomas-phd
2005-2009	Predoctoral Fellow, Laboratory of Neurogenetics under Dr. Mark R. Cookson, National Institute on Aging, National Institutes of Health, Bethesda, MD
2004-2005	Postbaccalaureate Fellow, Laboratory of Neurogenetics under Dr. David Goldman, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Rockville, MD
Summer 2003	Undergraduate Fellow, Biomedical Research Apprenticeship (BioMedRAP), laboratory of Dr. Michael Lovett, Washington University School of Medicine, St. Louis, MO
Spring 2003	Undergraduate Fellow, University of Capetown, Capetown, South Africa
2003-2004	Undergraduate Fellow, Laboratory of Dr. Stephen Benedict, University of Kansas, Lawrence, KS
2000-2003	Undergraduate Fellow, Laboratory of Dr. Dean Stetler, University of Kansas, Lawrence, KS

HONORS AND AWARDS

2011	Mitochondrial Dynamics Conference Postdoctoral Travel Award
2011	Mitochondrial Physiology and Pathology Conference Postdoctoral Travel Award
2010	ECDO Euroconference on Apoptosis Postdoctoral Travel Award
2010	European School of Haematology Conference Postdoctoral Travel Award

Kelly Jean Thomas Craig, PhD

2009	EMBO Workshop on Mitochondria, Apoptosis and Cancer Postdoctoral Travel Award
2008	European Bioenergetics Conference Graduate Student Travel Award
2007	Distinction in Biochemistry, Cell and Molecular Biology, Georgetown University
2006	Distinction in Biochemistry, Cell and Molecular Biology, Georgetown University

LEADERSHIP AND PROFESSIONAL MEMBERSHIPS

2011-2012	Keystone Symposia Scientific Advisory Board Member
2011-current	United Mitochondrial Disease Foundation Mitochondrial Champion
2009-current	The Mitochondria Research Society Postdoctoral Member
2009-current	European Cell Death Organization Postdoctoral Member
2009-current	American Association for the Advancement of Science Postdoctoral Member
2007-2009	Society for Neuroscience Graduate Student Member
2006-2008	Georgetown University-NIH Graduate Partnership Planning Co-Chair
2005-2009	NIH Graduate Student Council Member
2001-current	Society for the Advancement of Chicanos and Native Americans in Science Member

C. Teaching and Mentoring Experience

2009-current	Mentor and Counsel Undergraduate Research Fellows, Saccomanno Research Institute, St. Mary's Hospital and Regional Medical Center, Grand Junction, CO
2005-2009	Mentor and Counsel Undergraduate Research Fellows -Georgetown University, Washington, DC -National Institute on Aging, NIH, Bethesda, MD
2006-2008	Lecturer, Introduction to Laboratory Techniques, Foundation for the Advanced Education in the Sciences, NIH, Bethesda, MD
2004-2005	Chair, Neurobiology and Addiction Seminar, Postbaccalaureate Research Fellows, National Institute on Alcohol Abuse and Alcoholism, NIH, Rockville, MD
2003-2004	Teaching Assistant, Introductory Genetics Lecture and Laboratory, University of Kansas, Lawrence, KS
Spring 2003	Advocate, HIV Prevention Program, University of Capetown, Capetown, South Africa
2002-2004	Peer Leader and Teaching Assistant, Principles of Molecular and Cellular Biology, University of Kansas, Lawrence, KS

D. Qualified Instruction

The following table lists some but *not* all of the courses I am qualified to teach.

Lower-division:	Upper-division:
Attributes of Living Systems	Advanced Research
Cellular Biology	Biochemistry
General Physiology	Human Genetics
Forensic Molecular Biology	Lab. Techniques in Molecular Biology & Molecular Genetics
Introduction to Neuroscience	Metabolic Biochemistry
Principles of Genetics	Molecular Cell Biology
Structured Research	Molecular Genetics
	Molecular Neurobiology
	Senior Research
	Tumor Biology

E. Publications and Presentations

PEER-REVIEWED PUBLICATIONS

Thomas KJ and Jacobson MR. A lung cancer model linking apoptotic resistance and metastatic potential via defects in mitochondrial fission protein dynamin-related protein 1. Submitted manuscript under revision, December 2010.

Thomas KJ, McCoy M, Blackinton J, Beilina A, van der Brug M, Sandebring A, Miller D, Maric D, Cedazo-Mingues A, Cookson MR. DJ-1 acts in parallel to the PINK1/parkin pathway to control mitochondrial function and autophagy. *Hum Mol Genet.* 20(1): 40-50, 2011.

Thomas KJ and Cookson MR. The role of PTEN-induced kinase 1 in mitochondrial dysfunction and dynamics. *Intl J Biochem and Cell Biol.* 41(10): 2025-35, 2009.

Sandebring A, Dehvari N, Perez-Manso M, **Thomas KJ**, Karpilovski E, Cookson MR, Cowburn RF, Cedazo-Mínguez A. Parkin deficiency disrupts calcium homeostasis by modulating phospholipase C signaling. *FEBS J.* 276(18): 5041-52, 2009.

Thomas KJ, Sandebring A, Beilina A, van der Brug M, Cleland M, Ahmad R, Miller DW, Zambrano I, Cowburn R, Behbahani H, Cedazo-Mingues A, Cookson MR. Mitochondrial alterations in PINK1 deficient cells are influenced by calcineurin-dependent dephosphorylation of dynamin-related protein 1. *PLoS One.* 4(5): e5701, 2009.

Weihofen A, **Thomas KJ**, Ostaszewski BL, Cookson MR, Selkoe DJ. Pink1 forms a multiprotein complex with Miro and Milton, linking Pink1 function to mitochondrial trafficking. *Biochemistry.* 48(9): 2045-52, 2009.

Blackinton J, Lakshminarasimhan M, **Thomas KJ**, Ahmad R, Greggio E, Raza AS, Cookson MR, Wilson MA. Formation of a stabilized cysteine sulfinic acid is critical for the mitochondrial function of the parkinsonism protein DJ-1. *J Biol Chem.* 284(10): 6476-85, 2009.

Mortiboys H, **Thomas KJ**, Koopman WJ, Klaffke S, Abou-Sleiman P, Olpin S, Wood NW, Willems PH, Smeitink JA, Cookson MR, Bandmann O. Mitochondrial function and morphology are impaired in parkin-mutant fibroblasts. *Ann Neurol.* 64(5): 555-65, 2008.

van der Brug MP, Blackinton J, Chandran J, Hao LY, Lal A, Mazan-Mamczarz K, Martindale J, Xie C, Ahmad R, **Thomas KJ**, Beilina A, Gibbs JR, Ding J, Myers AJ, Zhan M, Cai H, Bonini NM, Gorospe M, Cookson MR. RNA binding activity of the recessive parkinsonism protein DJ-1 supports involvement in multiple cellular pathways. *Proc Natl Acad Sci USA.* 105(29): 10244-9, 2008.

Greggio E, Zambrano I, Kaganovich A, Beilina A, Taymans JM, Daniëls V, Lewis P, Jain S, Ding J, Syed A, **Thomas KJ**, Baekelandt V, Cookson MR. The Parkinson disease-associated leucine-rich repeat kinase 2 (LRRK2) is a dimer that undergoes intramolecular autophosphorylation. *J Biol Chem.* 283(24): 16906-14, 2008.

Haque ME, **Thomas KJ**, D'Souza C, Callaghan S, Kitada T, Slack RS, Fraser P, Cookson MR, Tandon A, Park DS. Cytoplasmic Pink1 activity protects neurons from dopaminergic neurotoxin MPTP. *Proc Natl Acad Sci USA.* 105(5): 1716-21, 2008.

Greggio E, Jain S, Kingsbury A, Bandopadhyay R, Lewis P, Kaganovich A, van der Brug MP, Beilina A, Blackinton J, **Thomas KJ**, Ahmad R, Miller DW, Kesavapany S, Singleton A, Lees A, Harvey RJ, Harvey K, Cookson MR. Kinase activity is required for the toxic effects of mutant LRRK2/Dardarin. *Neurobiol Dis.* 23(2): 329-41, 2006.

PRESENTATIONS AT NATIONAL/INTERNATIONAL MEETINGS
*Oral presentations were by invitation.

A lung cancer model linking apoptotic resistance and metastatic potential via defects in mitochondrial fission protein dynamin-related protein 1. **Thomas KJ** and Jacobson MR. Saccomanno Research Institute, St. Mary's Hospital, Grand Junction, CO.

-8th Conference on Mitochondrial Physiology and Pathology, oral presentation* 9/2011

A lung cancer model linking apoptotic resistance and tumorigenesis via defects in mitochondrial dynamics. Thomas KJ and Jacobson MR. Saccomanno Research Institute, St. Mary's Hospital, Grand Junction, CO.

-ECDO Euroconference on Apoptosis, oral presentation* 9/2010

Mitochondrial dynamics and dysfunction in lung cancer cells. **Thomas KJ** and Jacobson MR. Saccomanno Research Institute, St. Mary's Hospital, Grand Junction, CO.

-EMBO Workshop on Mitochondria, Apoptosis and Cancer, poster 10/2009

PTEN-induced kinase 1 affects mitochondrial dynamics via phosphorylation of Dynamin-related protein 1. **Thomas KJ**, Sandebring A, Beilina A, van der Brug M, Cleland M, Ahmad R, Miller DW, Zambrano I, Cowburn R, Behbahani H, Cedazo-Mingues A, Cookson MR. Cell Biology and Gene Expression Unit, Laboratory of Neurogenetics, National Institute on Aging, NIH, Bethesda, MD

-Georgetown University Graduate Student Symposium, oral presentation* 3/2008
-National Institute on Aging Scientific Retreat, poster 3/2008
-European Bioenergetics Conference, poster 7/2008
-Society for Neuroscience, platform oral presentation* 11/2008

Increased Expression of the Parkinson's Disease Associated Kinase PINK1 by Modulators of the PTEN pathway. **Thomas KJ**, van der Brug MP, Daigle K, Duckworth J, Gibbs JR, Beilina A, Cookson MR. Cell Biology and Gene Expression Unit, Laboratory of Neurogenetics, National Institute on Aging, NIH, Bethesda, MD.

-Georgetown University Graduate Student Symposium, oral presentation* 4/2007
-National Institute on Aging Scientific Retreat, poster 4/2007
-NIH Graduate Student Symposium, poster 5/2007
-NIH Graduate Student Retreat, poster 9/2007
-Society for Neuroscience, platform oral presentation* 11/2007
-World Parkinson's Congress, poster 12/2007

Transcriptional Regulation of PINK1. **Thomas KJ**, van der Brug MP, Daigle K, Cookson MR. Cell Biology and Gene Expression Unit, Laboratory of Neurogenetics, National Institute on Aging, NIH, Bethesda, MD.

-Winter Conference on Brain Research, poster 1/2007

PINK1 Induction using PTEN/Akt modulators. **Thomas KJ**, van der Brug MP, Daigle K, Cookson MR. Cell Biology and Gene Expression Unit, Laboratory of Neurogenetics, National Institute on Aging, NIH, Bethesda, MD.

-NIH Graduate Student Retreat, poster 9/2006

Expression, Localization and Putative Toxicity of Dardarin and Alpha-synuclein. **Thomas KJ**, Greggio E, Kaganovich A, Cookson MR. Cell Biology and Gene Expression Unit, Laboratory of Neurogenetics, National Institute on Aging, NIH, Bethesda, MD.

-NIH Graduate Student Seminar, oral presentation* 8/2005

Linkage Analyses of *ANKK1* to Psychiatric Disorders and Substance Abuse. **Thomas KJ**, Xu K, Goldman D. Laboratory of Neurogenetics, National Institute on Alcohol Abuse and Alcoholism, NIH, Rockville, MD.

-NIH Postbaccalaureate Poster Day, 5/2005

Kelly Jean Thomas Craig, PhD

F. Grants/Funding

SUBMITTED/PENDING REVIEW

2013-2015 Principal Investigator, United Mitochondrial Disease Foundation

2013-2015 Principal Investigator, R21 PA-011-144, National Cancer Institute, National Institutes of Health

COMPLETED

2009-2011 Postdoctoral Research Fellow, St. Mary's Hospital Foundation, 2009-2011

2005-2009 Predoctoral Research Fellow, Intramural Research Program, National Institute on Aging, National Institutes of Health

2004-2005 Postbaccalaureate Fellow, Intramural Research Program, National Institute on Alcohol Abuse and Alcoholism

2000-2004 Undergraduate Research Fellow, National Institute of General Medical Sciences, National Institutes of Health

G. References

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Curriculum Vitae

Department of Biology
Carroll University
100 N. East Ave
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EDUCATION

Ph.D. Environmental and Evolutionary Biology, University of Louisiana at Lafayette. 2010.

M.S. Biology, University of Texas at Tyler. 2004.

B.S. Biological Sciences, Eastern Illinois University. 2001.

ACADEMIC EMPLOYMENT

Faculty Lecturer, Carroll University. 2010-present.
- Comparative Vertebrate Morphology, Organismal Physiology, Human Anatomy and Physiology I and II

Research Assistant, University of Louisiana at Lafayette. Energetics of rattling in rattlesnakes; an NSF funded project awarded to B.R. Moon. 2008-2010.

Doctoral Fellow, University of Louisiana at Lafayette. 2005-2008.

Lecturer, University of Louisiana at Lafayette. 2007.
- General Biology II

Teaching Assistant, University of Louisiana at Lafayette. 2006-2007.
- General Biology I and II lab

Adjunct Lecturer, University of Texas at Tyler. 2005.
- Labs for Human Anatomy and Physiology, Herpetology

Teaching Assistant, University of Texas at Tyler. 2002-2004.
- Labs for Biology I and II, Ecology, Vertebrate Natural History

MENTORING EXPERIENCE

Research advisor for 4 undergraduate students at Carroll University and 7 undergraduate students at the University of Louisiana at Lafayette

Research supervisor for 4 high school students while at UL Lafayette

INVITED LECTURES

Herpetology, Energetics and Performance. University of Louisiana at Lafayette. 2009.

PEER-REVIEWED PUBLICATIONS (15)

Hampton, P.M. and B.R. Moon. (Accepted). Morphological components of gape size in western diamond-backed rattlesnakes (*Crotalus atrox*). Journal of Morphology.

Hampton, P.M. 2011. Comparison of cranial form and function in association with prey preference in natricine snakes. Journal of Morphology. 272:1435-1443.

Hampton, P.M. 2011. Feeding performance in the western ribbon snake: ontogeny and the affects of prey type and size. Canadian Journal of Zoology. 89:945-950.

Hampton, P.M. 2011. Ventral and sub-caudal scale counts are associated with macrohabitat use and tail specialization in viperid snakes. Evolutionary Ecology. 25:531-546.

Hampton, P.M., N.B. Ford, K. Herriman. 2010. Impacts on herpetofauna in a disturbed floodplain in Smith County, Texas. American Midland Naturalist. 163:44-53.

Hampton, P.M. 2009. Ecology of the Western Lesser Siren, *Siren intermedia nettingi*, in an isolated East Texas pond. Journal of Herpetology. 43:704-709.

Ford, N.B. and P.M. Hampton. 2009. Relationship among morphology, diet, and foraging mode: Prey size and meal size in an active foraging snake (*Thamnophis proximus*). Canadian Journal of Zoology 87:254-261.

Hampton, P.M., N.E. Haertle, S.F. Dartez, C. Monteiro. 2009. New prey records for the Broad-banded (*Nerodia fasciata*) and the Diamondback watersnakes (*Nerodia rhombifer*). Southwestern Naturalist.

Hampton, P.M. and N.E. Haertle. 2009. A new view from a novel squeeze box design. Herpetological Review. 40:44.

Hampton, P.M. 2008. A report of new prey items of the western ribbon snake, *Thamnophis proximus*. Southwestern Naturalist. 53:116-119.

Hampton, P.M. and N.B. Ford. 2007. The effects of flood suppression on natricine snake diet and prey overlap. Canadian Journal of Zoology. 85:809-814.

Hampton, P.M. 2007. A comparison of artificial cover types, plywood and corrugated tin. Amphibia-Reptilia. 28:433-437.

Fontenot, B.E., N.B. Ford, R. Brenes, and P.M. Hampton. 2006. New county records for reptiles and amphibians from northeast Texas. Herpetological Review. 37:111-112.

Ford, N.B. and P.M. Hampton. 2005. The amphibians and reptiles of Camp Maxey, Lamar County, Texas with comments on census methods. The Texas Journal of Science. 57:359-370.

Foster, C.D. and P.M. Hampton. 2003. A survey of amphibians and reptiles in three state parks in east central Illinois. Transactions of the Illinois State Academy of Science. 96:219-228.

NATURAL HISTORY NOTES (17)

Dartez, S.F., P.M. Hampton, N.E. Haertle, C.S. Monteiro. 2011. *Lampropeltis getula holbrooki*. Diet. Herpetological Review. 42:293.

Hampton, P.M. 2011. *Micrurus fulvius*. Diet. Herpetological Review. 42:294.

Hampton, P.M. 2010. *Causus rhombeatus*. Diet. Herpetological Review. 41:234-235.

Fontenot, B.E. and P.M. Hampton. 2009. *Scaphiophus couchii*. Predation. Herpetological Review 40:73.

Hampton, P.M. 2008. *Farancia abacura*. Predation. Herpetological Review 39:469-470.

Hampton, P.M and B.E. Fontenot. 2007. *Thamnophis marcianus marcianus*. Diet. Herpetological Review 38:95.

Hampton, P.M. 2007. *Thamnophis proximus proximus*. Necrophagy. Herpetological Review 38:94-95.

Hampton, P.M. 2007. *Nerodia erythrogaster flavigaster*. Anti-predatory Behavior. Herpetological Review 38:91.

Hampton, P.M. 2007. *Nerodia fasciata confluens*. Diet. Herpetological Review 38:91.

Hampton, P.M. 2007. *Nerodia erythrogaster flavigaster*. Diet. Herpetological Review 38:91.

Hampton, P.M. 2006. *Notophthalmus viridescens louisianensis*. Gilled Adult Population. Herpetological Review 37:71.

Hampton, P.M. 2006. *Ambystoma t. tigrinum*. Paedomorphic Population. Herpetological Review 37:69.

Hampton, P.M. and N.B. Ford. 2005. *Agkistrodon piscivorus*. Reproduction. Herpetological Review 36:455.

Hampton, P.M. 2005. *Agkistrodon piscivorus*. Morphology. Herpetological Review 36:454-455.

Braman, S.C. and P.M. Hampton. 2005. *Elaphe obsoleta*. Diet. Herpetological Review 36:194.

Hampton, P.M. and M.L. Nicholson. 2004. *Hyla cinerea*. Geographical Distribution. Herpetological Review 35:403.

Hampton, P.M., C.D. Foster and J.B. Towey. 2004. *Scincella lateralis*. Predation. Herpetological Review 35:269-270.

Manuscripts in Review

Hampton, P.M. Feeding in natricines: relationships among feeding morphology, behavior, performance, and preferred prey. *Target journal*: Journal of Zoology.

Manuscripts in Preparation (draft available)

Hampton, P.M. Coupling of external morphology and internal anatomy in the snake feeding system and its relation to prey shape. *Target journal*: Evolutionary Ecology.

Kalmus, T.C.* and P.M. Hampton. Single large or several small: effect of prey size on the price of a meal. *Target journal*: Journal of Herpetology.

* denotes undergraduate student

Technical Reports

Ford, N.B. 2003. Inventory of the amphibians and reptiles of Camp Maxey. Species accounts by P.M. Hampton. Prepared for the Army National Guard.

Oral Presentations (14)

Hampton, P.M. Macroecological patterns associated with diet breadth in snakes. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2011.

Haertle, N. and P.M. Hampton. Color pattern variation in copperhead snakes (*Agkistrodon contortrix*) Louisiana Herpetological Group Meeting. 2010.

Hampton, P.M. Interspecific feeding performance among natricines. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2009.

Hampton, P.M. Morphological and Anatomical Correlates to Prey Shape in Snakes. Society of Integrative and Comparative Biologists. January 2009.

Hampton, P.M. Morphological and Anatomical Correlates to Prey Shape in Snakes. Louisiana Herpetological Group Meeting. November 2008.

Hampton, P.M. Morphological and Anatomical Correlates to Prey Shape in Snakes. University of Louisiana at Lafayette Graduate Student Symposium. October 2008.

Hampton, P.M. Ecomorphology in viperids: evolution of vertebral number in relation to habitat and tail use. University of Louisiana at Lafayette Graduate Student Symposium. November 2007.

Hampton, P.M. The effects of flood suppression on dietary niche overlap in natricines. University of Louisiana at Lafayette Graduate Student Symposium. October 2006.

Hampton, P.M. and N.B. Ford. The effects of flood suppression on diet and niche overlap in natricines. Meeting of the Louisiana Association of Professional Biologists. August 2006.

Hampton, P.M. and N.B. Ford. The effects of flood suppression on diet and competition in some natricines. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2006.

Hampton, P.M. Effects of habitat modifications on amphibian and reptile communities in an east Texas floodplain. University of Louisiana at Lafayette Graduate Student Symposium. September 2005.

Hampton, P.M. Effects of management techniques on amphibian and reptile populations in an east Texas floodplain. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. June 2004.

Ford, N.B., P.M. Hampton and D.B. Ford. Ontogenetic and seasonal variation in diet of the Western Ribbon Snake, *Thamnophis proximus*, in a northeast Texas floodplain. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. June 2004.

Hampton, P.M. and N.B. Ford. Anthropogenic effects on the herpetofauna of the Old Sabine Bottom Wildlife Management Area. Southwestern Association of Naturalists. April 2004.

POSTER PRESENTATIONS (18)

Hampton, P.M. Relationships among dietary richness, geographic range and morphology in snakes. Ecological Society of America Annual Meeting. August 2011.

Moon, B.R., N. Haertle, P.M. Hampton. Rates of breathing, oxygen consumption, and evaporative water loss in rattlesnakes. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2011.

Kalmus, T.C.* and P.M. Hampton. Single large or several small: effect of prey size on the price of a meal. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2011.

Moon, B.R. and P.M. Hampton. Using rattlesnake shaker muscle to test how long tendons affect the energetic cost of contraction. Ninth International Congress of Vertebrate Morphology, Punta del Este, Uruguay, July 2010.

Hampton, P.M. and B.R. Moon. Morphological contributors to gape size in snakes. Ninth International Congress of Vertebrate Morphology, Punta del Este, Uruguay, July 2010.

Hampton, P.M. and B.R. Moon. Morphological contributors to gape size in snakes. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2010.

Moon, B.R. and P. M. Hampton. Respiratory water loss during rattling in rattlesnakes. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2010.

Hampton, P.M. Does prey envenomation improve digestive performance in *Agkistrodon piscivorus*? Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2009.

Moon, B.R. and P.M. Hampton. Using rattlesnake shaker muscle to test how long tendons affect the energetic cost of contraction. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. July 2009.

Hampton, P.M. Ecological and morphological correlates of foraging mode in snakes. Snake Ecology Group Meeting. July 2009.

Moon, B.R. and P.M. Hampton. The effects of long tendons on the energetic cost of muscle contraction. Society of Integrative and Comparative Biologists. January 2009.

Hampton, P.M. Does prey envenomation improve digestive performance in *Agkistrodon piscivorus*? Society of Integrative and Comparative Biologists. January 2009.

Hampton, P.M. Ecological and Morphological Correlates of Foraging Mode in Snakes. University of Louisiana at Lafayette Graduate Student Symposium. October 2008.

Hampton, P.M. and J.M. Meik. Historical Biogeography of New World Natricines. University of Louisiana at Lafayette Graduate Student Symposium. November 2007.

Hampton, P.M. and J.M. Meik. Historical Biogeography of New World Natricines. Annual meeting of the Herpetologists' League/American Society of Ichthyologists and Herpetologists. July 2007.

Hampton, P.M. and M.L. Nicholson. Ecology of *Siren intermedia* in an isolated pond. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles July 2005.

Hampton, P.M and N.B. Ford. Food partitioning by three species of semi-aquatic snakes in an East Texas Floodplain. Snake Ecology Group Meeting IV. May 2004.

Hampton, P.M. Habitat use by herpetofauna in a disturbed floodplain in Smith County, Texas. Joint meeting of the American Society of Ichthyologists and Herpetologists, Herpetologist's League and the Society for the Study of Amphibians and Reptiles. June 2003.

* denotes undergraduate student

SELECTED AWARDS, GRANTS AND SCHOLARSHIPS

Faculty Improvement Grant. Carroll University. $160.00. 2011. Influence of island biogeography and ecology on snake morphology.

Faculty Improvement Grant, Carroll University. $1290.00. 2011. Relationships among dietary richness, geographic range and morphology in snakes.

Pioneer Scholar Grant, Carroll University. $2000. 2011. Single large or several small: effect of prey size on the price of a meal.

Faculty Improvement Grant, Carroll University. $700. 2010. Single large or several small: effect of prey size on the price of a meal.

Howard McCarley Student Research Award, Southwestern Association of Naturalists. $1000. 2009. Venom function in pitvipers: Does prey envenomation enhance digestive performance and reduce its cost?

Chicago Herpetological Society, Graduate Student Research in Herpetology Grant. $500. 2009. Venom function in pitvipers: Does prey envenomation enhance digestive performance and reduce its cost?

Chicago Field Museum of Natural History Visiting Scholarship. $1400. 2008. The evolution of gape in snakes and its relation to prey richness, range size and species radiation.

Best poster presentation, UL Lafayette Graduate Student Symposium, 2008. Ecological and morphological correlates of foraging mode in snakes.

University of Louisiana at Lafayette, Doctoral Fellowship. 2005-2008.

Rockefeller State Wildlife Scholarship. $1000. 2008, 2009.

Best oral presentation, UL Lafayette Graduate Student Symposium, 2007. Evolution of vertebral number, macrohabitat use and tail specialization in the family Viperidae.

University of Louisiana at Lafayette, GSO travel award. $400. 2006, 2007.

University of Louisiana at Lafayette, GSO research grants (8).

Society for the Study of Amphibians and Reptiles Graduate Student Travel Award. $200. 2005.

University of Texas at Tyler graduate student scholarship. $1000. 2002, 2003.

Texas Herpetological Society. $500. 2003. Impacts of active oil pumps and deer feed plots on amphibian and reptile assemblages in a floodplain.

PROFESSIONAL SERVICE AND PUBLIC OUTREACH

Journal Referee for Biologia (1), Canadian Journal of Zoology (3), Herpetologica (2), Journal of Arid Environments (1), Journal of Herpetology (1), Journal of Zoology (1), Southeastern Naturalist (1), Southwestern Naturalist (1).

Faculty Evaluation Committee, Carroll University. 2011-present.

Program Curriculum Assessment Committee, Carroll University. 2011-present.

Herpetologist's League Graduate Student Studies Committee, Co-Chair. 2009-2010.

Herpetology Education Awards Committee, 2010.

Graduate Student Symposium Committee, Chair. 2008, 2009.

Experience Atchafalaya Days, public education about local snakes. 2009.

Education demonstrations for middle school. 2008.

Science Olympiad, Herpetology for High School. 2008, 2009.

Science Olympiad, Amphibians and Reptiles for Junior High. 2008, 2009.

Tyler Independent School District, educational presentations. 2002-2005.

Boy Scouts of America, Instructor for Amphibian and Reptile merit badge. 2002.

Eriek S. Hansen - Curriculum Vitae
1100 North Avenue, Colorado Mesa University, Grand Junction, Colorado 81501
Phone: 435-881-5416, Email: *erihansen@coloradomesa.edu*

EDUCATION

Doctor of Philosophy – Ecology. University of Wyoming, Laramie, Wyoming. August 2013. *Temporal Variations in Riverine Fish Habitat and the Potential Responses of Fish.*

Master of Science – Aquatic Ecology. Utah State University, Logan, Utah. December 15, 2007. *Evaluating the effectiveness of passive stream restoration for improving native fish health and minimizing the impacts of disease.*

Bachelor of Science – Fisheries and Wildlife Management. Utah State University, Logan, Utah. May 5, 2000.

EMPLOYMENT

August 2013 – Present.	Assistant Professor of Vertebrate Biology. Colorado Mesa University.
September 2012 – August 2013.	Science Posse Graduate Fellow. University of Wyoming.
August 2007 – August 2013.	Graduate Research Assistant. Program in Ecology, Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming. "The Influence of River Surface Ice on the Behavior and Energetics of Fish with Implications for the Response of Stream Fishes to Climate Change".
June 2009 – Present.	Instructor for Chemistry and Ecology Research Mentor. Upward Bound, Federal TRIO programs, University of Wyoming.
January 2012 – May 2012.	Ichthyology Teaching Assistant and Lab Instructor. Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming.
August 2011 – December 2011.	Fisheries Management Teaching Assistant and Lab Instructor. Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming.
August 2010 – December 2010.	Fisheries Management Teaching Assistant and Lab Instructor. Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming.
January 2010 – May 2010.	Ichthyology Teaching Assistant and Lab Instructor. Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming.

August 2009 – December 2009.	Fisheries Management Teaching Assistant and Lab Instructor. Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming.
June 2009 – July 2009.	Instructor for Computer Science. Upward Bound, Federal TRIO programs, University of Wyoming.
August 2008 – December 2008.	Fisheries Management Teaching Assistant and Lab Instructor. Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming.
January 2008 – May 2008.	Ichthyology Teaching Assistant and Lab Instructor. Department of Zoology and Physiology, University of Wyoming, Laramie Wyoming.
June 2005 – August 2007.	Graduate Research Assistant. USGS Utah Cooperative Fish and Wildlife Research Unit, Department of Aquatic, Watershed, and Earth Resources, Utah State University, Logan, UT. Master of Science Program in the Ecology Center, College of Natural Resources. "Evaluating the effectiveness of passive stream restoration for improving native fish health and minimizing the impacts of disease."
May 2000 – June 2005.	Utah Division of Wildlife Resources, Fisheries Experiment Station, Logan, UT. Wildlife Specialist. June sucker culture and propagation research.
December 1999 – February 2000.	Utah State University, Ecology Center. Research Technician. Identification and enumeration of zooplankton.
May 1999 – February 2000.	Utah State University, Department of Fisheries and Wildlife. Research Technician. Research of walleye in five mid-elevation Utah reservoirs.

TEACHING EXPERIENCE

August 5-9, 2013. Science Posse and NASA Space Grant Consortium. Exploring Science Workshop for Teachers. University of Wyoming

June 10-13, 2013. Science Posse and Teton Science School. Exploring Science, Camp for middle school students. Teton Science School, Kelly, Wyoming.

September 2008 – Present. Science Posse. Teaching fellow. University of Wyoming.

June 17-22, 2012. Science Posse and School of Energy Resources. Energy Summer Institute. Summer educational program for 9th and 10th graders, University of Wyoming.

Fall semesters 2008 - 2011.Fisheries Management (Zoo 4310/5310). Teaching assistant and lab instructor. University of Wyoming, Department of Zoology and Physiology.

Spring semesters 2008, 2010, and 2012.Ichthyology (Zoo 4330/5330). Teaching assistant and lab instructor. University of Wyoming, Department of Zoology and Physiology.

Summer 2011 and 2012. Ecology mentorship. Instructor. Upward Bound, Federal TRIO Program, University of Wyoming.

Summer 2010. Freshwater and marine ecology mentorship. Instructor. Upward Bound, Federal TRIO Program, University of Wyoming.

Summer 2009 - 2012.Chemistry. Instructor. Upward Bound, Federal TRIO Program, University of Wyoming.

Summer 2009. Computer science. Instructor. Upward Bound, Federal TRIO Program, University of Wyoming.

May 21-25, 2007. Teaching Assistant – Planning and Executing Successful Rotenone and Antimycin Projects. American Fisheries Society-Task Force on Fishery Chemicals, Utah State University.

TEACHING TRAINING RECEIVED

Fundamentals of Inquiry Workshop, Exploratorium, San Francisco, CA. Will be attending December 3-7, 2012.

College Science Teaching – Graduate Seminar. Fall 2012.

Teaching and Testing for Scientific Literacy. Facilitated by Peggy Brickman, University of Georgia. Hosted by Ellbogen Teaching and Learning Center, University of Wyoming. March 2, 2012.

Science Posse New Fellow Training. University of Wyoming. August 20-22, 2012.

Exploring Science Teacher Workshop. Science Posse and NASA Space Grant Consortium, University of Wyoming. August 6-10, 2012.

TEACHING TRAINING PROVIDED

Science Posse Fellow – Bringing geographic information systems (GIS) into the classroom. Wyoming Math and Science Teacher's Conference, Casper College, Casper, Wyoming. October 15-16, 2012.

OUTREACH

Women in Science, Wyoming NASA Space Grant Consortium. Workshop "What's in the Water", May 2010, 2011, and 2012.

Bear River Festival. Provided poster on the Spawn Creek restoration project, May 2007.

Trout Unlimited-Cache Anglers. Presentation on the Spawn Creek restoration project, April 2007.

Trout Unlimited-Cache Anglers. Presentation on the Spawn Creek restoration project, April 2006.

PUBLICATIONS

Hansen, E. S. 2013. Temporal Variations in Riverine Fish Habitat and the Potential Responses of Fish. Doctor of Philosophy dissertation. University of Wyoming, Laramie, Wyoming.

Hansen, E. S., and P. Budy. 2011. The potential of passive stream restoration to improve stream and riparian habitat and minimize the impact of disease on fish: A short-term assessment. *Journal of the North American Benthological Society* 30(2):573-588.

Budy, P., G. P. Thiede, P. McHugh, **E. S. Hansen**, and J. Wood. 2008. Exploring the relative influence of biotic interactions and environmental conditions on the abundance and distribution of exotic brown trout (*Salmo trutta*) in a high mountain stream. *Ecology of Freshwater Fish* 17:554-566.

Hansen, E. S. 2007. Evaluating the effectiveness of passive stream restoration for improving native fish health and minimizing the impacts of disease. Master's thesis. Utah State University, Logan, Utah.

Andersen, M. E., C. J. Keleher, J. E. Rasmussen, **E. S. Hansen**, P. D. Thompson, D. W. Speas, M. D. Routledge, and T. N. Hedrick 2007. Status of June sucker in Utah Lake and refuges *in* M. J. Brouder and J. A. Scheurer, editors. *Status, distribution, and conservation of native freshwater fishes of western North America: a symposium proceedings*. American Fisheries Society Symposium 53, Bethesda, Maryland.

TECHNICAL REPORTS

Budy, P., **E. S. Hansen**, and G.P. Thiede. 2008. Spawn Creek whirling disease study: evaluating the effectiveness of passive stream restoration for improving native fish health and minimizing the impacts of whirling disease. 2007 Final Report to Utah Division of Water Quality (Non-point Source 319[h] Project, Environmental Protection Agency 310[h], Grant Number 061139) and to Utah Division of Wildlife Resources. Sport Fish Restoration. Grant number XIII. Project F-47-R. UCFWRU 2008(5):1-21.

Budy, P., **E. S. Hansen**, and G.P. Thiede. 2007. Spawn Creek whirling disease study: evaluating the effectiveness of passive stream restoration for improving native fish health and reducing the impacts of whirling disease. 2006 Annual Report to Utah Division of Wildlife Resources. Sport Fish Restoration. Grant number XIII. Project F-47-R. UCFWRU 2006(3):1-31.

Budy, P., G.P. Thiede, **E.S. Hansen**, and J. Wood. 2007. Logan River whirling disease study: factors affecting trout population dynamics, abundance, and distribution in

the Logan River, Utah. 2006 Annual Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant number XIII. Project F-47-R. 46 pages.

Budy, P., **E. S. Hansen**, and G. P. Thiede. 2006. Spawn Creek whirling disease study: evaluating the effectiveness of passive stream restoration for improving native fish health and reducing the impacts of whirling disease. 2005 Annual Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant number XIII, Project F-47-R. UCFWRU 2005(3):1-31.

Budy, P., G. P. Thiede, P. McHugh, and **E. Hansen**. 2006. Logan River whirling disease study: factors affecting trout population dynamics, abundance, and distribution in the Logan River, Utah. 2005 Annual Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant number XIII, Project F-47-R. UCFWRU 2005(2):1-129.

Hansen, E. 2004. Utilization of cold water to promote egg development in captive June sucker. Ichthyogram 15-4:10-12. Utah Division of Wildlife Resources: Fisheries Experiment Station, Logan, Utah.

Hansen, E. 2004. Comparison of feed regimes for rearing juvenile June sucker (*Chasmistes liorus*). Ichthyogram 15-3:4-6, 10. Utah Division of Wildlife Resources: Fisheries Experiment Station, Logan, Utah.

Hansen, E. 2003. Evaluation of induced spawning techniques and requirements in captive June sucker, *Chasmistes liorus*. Ichthyogram 14-4:6-10. Utah Division of Wildlife Resources: Fisheries Experiment Station, Logan, Utah.

Hansen, E. 2003. Evaluation of feed regimes for rearing June sucker (*Chasmistes liorus*). Ichthyogram 14-1:1, 6-7. Utah Division of Wildlife Resources: Fisheries Experiment Station, Logan, Utah.

Hansen, E. 2002. Evaluation of diets for rearing June sucker (*Chasmistes liorus*). Ichthyogram 13-4:9-11. Utah Division of Wildlife Resources: Fisheries Experiment Station, Logan, Utah.

ORAL PRESENTATIONS

Hansen, E. S. The life aquatic – past, present, and future. Invited seminar Colorado Mesa University. Grand Junction, Colorado, March 4, 2013.

Hansen, E. S. and F. J. Rahel. 2012. Disturbed: A story about fish habitat in the Laramie River. American Fisheries Society, Colorado-Wyoming Chapter Annual Meeting. Fort Collins, Colorado, February 25-27, 2013.

Hansen, E. S. and F. J. Rahel. 2012. Disturbed: A true to life story about fish habitat in the Laramie River. University of Wyoming, Department of Zoology and Physiology Brown Bag Seminar Series. April 2, 2012.

Hansen, E. S. and F. J. Rahel. 2012. How does river surface ice influence water temperature and fish energy use? American Fisheries Society, Colorado-Wyoming Chapter, Western Division Annual Meeting Wyoming "Ecosystem management in a Twitter world". Jackson Hole, Wyoming, March 26-29, 2012.

Hansen, E. S. and F. J. Rahel. 2011. Fish, ice, and videotape. University of Wyoming, Department of Zoology and Physiology Brown Bag Seminar Series. April 4, 2011.

Hansen, E. S. and F. J. Rahel. 2011. Fish, ice, and videotape. American Fisheries Society, Colorado-Wyoming Chapter, Wildlife Society, Colorado Chapter Co-Annual Meeting Wyoming "From the Cradle to the Grave: Recruiting and Retaining Natural Resource Recreationists". Fort Collins, Colorado, February 22-25, 2011.

Hansen, E. S., and F. J. Rahel. 2009. Winter fish ecology: the role of surface ice and climate change. 2009 Graduate School Graduate Student Symposium, University of Wyoming. Laramie, Wyoming, April 6-7, 2009.

Hansen, E. S., P. Budy, and G. P. Thiede. 2008. Evaluating the effectiveness of passive stream restoration for improving native fish health and minimizing the prevalence and impact of whirling disease. American Fisheries Society, Colorado-Wyoming Chapter Annual Meeting Wyoming "From Buckets to Bilge Pumps: Addressing the Spread of Exotic Fish and Organisms in Western Watersheds". Cheyenne, Wyoming, March 3-7, 2008.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. Evaluating the effectiveness of passive stream restoration for improving fish health and minimizing the effects of disease. University of Wyoming, Department of Zoology and Physiology Brown Bag Seminar Series. October 8, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. Evaluating the effectiveness of passive stream restoration for improving fish health and minimizing the effects of disease. Thesis Defense Seminar, Utah State University, Department of Watershed Sciences. July 27, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. The Spawn Creek Restoration Project: Evaluating the effectiveness of passive stream restoration as a method for minimizing whirling disease and restoring stream function. Trout Unlimited, Utah Council. Quarterly Meeting, June 30, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. Evaluating the potential of passive stream restoration as a method to minimize the impact of whirling disease on native fish. Utah State University, Spring Runoff Conference. Logan, Utah, April 5-6, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. Investigating the use of passive stream restoration as a management tool for minimizing the impact of whirling disease. Utah State University, Graduate Research Symposium. Logan, Utah, April 4, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. Examining the potential of riparian restoration as a means to minimize the impact of whirling disease. American Fisheries Society, Bonneville Chapter Annual Meeting "Fish Management, a United Approach". Logan, Utah, March 19-21, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. Using passive restoration to reduce the impact of whirling disease. American Fisheries Society, Oregon Chapter 43rd Annual Meeting "Big Fish Over Big Dams: Complexities, Controversies, Opportunities". Eugene, Oregon, February 28-March 2, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2007. First year response of the Spawn Creek aquatic and riparian habitats to livestock exclusion. Trout Unlimited, Utah Council. Quarterly Meeting, February 24, 2007.

Hansen, E. S., P. Budy, and G. P. Thiede. 2006. Evaluating the effects of passive stream restoration on riparian and benthic habitat, and ultimately fish health. North American Benthological Society 54th Annual Meeting. Anchorage, Alaska, June 4-8, 2006.

Hansen, E. S., P. Budy, and G. P. Thiede. 2006. Evaluating the effectiveness of passive stream restoration for improving native fish health and reducing the impacts of whirling disease. American Fisheries Society, Bonneville Chapter Annual Meeting "Fish in the Balance". Park City, Utah, March 20-22, 2006.

Hansen, E. S., P. Budy, and G. P. Thiede. 2006. Evaluating the effectiveness of passive stream restoration for improving native fish health and reducing the impacts of whirling disease. 12th Annual Whirling Disease Symposium "War of the Whirlds". Denver, Colorado, February 9-10, 2006.

Hansen, E. 2005. June sucker culture and propagation research (current feed, temperature, spawning studies), and a comparison of macro and micro minerals in liver and bone samples of refuge populations. June Sucker Recovery Implementation Program, Annual Assessment Meeting, Salt Lake City, Utah.

Hansen, E. 2004. Evaluation of induced spawning techniques and requirements in captive June sucker Chasmistes liorus. American Fisheries Society, Western Division Annual Meeting, Salt Lake City, Utah.

Hansen, E. 2003. Summary of completed feed studies for rearing June sucker. June Sucker Recovery Implementation Program, Annual Assessment Meeting, Salt Lake City, Utah.

Hansen, E. 2003. Completed and planned feed studies for rearing June sucker. Native Aquatic Species Culture Workshop, Salt Lake City, Utah.

Hansen, E. 2002. Summary of 2001 June sucker status and activities at the Fisheries Experiment Station. June Sucker Recovery Implementation Program, Annual Assessment Meeting, Salt Lake City, Utah.

POSTER PRESENTATIONS

P. C. Gaskill, **E. S. Hansen**, and S. B. Gale. 2012. Brown trout (*Salmo trutta*) spawning patterns in an urban stream. American Fisheries Society, Colorado-Wyoming Chapter, Western Division Annual Meeting Wyoming "Ecosystem management in a Twitter world". Jackson Hole, Wyoming, March 26-29, 2012.

Hays, R. J., S. Laske, **E. S. Hansen**, and S. Gale. 2010. Brown trout (*Salmo trutta*) spawning: a two year look at spatial and temporal patterns in an urban stream, Wyoming. American Fisheries Society, Western Division Annual Meeting "The Future of Aquatic Resources in the West: Science, Management, and Politics". Salt Lake City, Utah, April 19-23, 2010.

Hays, R. J., **E. S. Hansen**, and A. C. Senecal. 2009. Spatial and temporal patterns of brown trout (*Salmo trutta*) spawning in an urban stream. American Fisheries Society, Colorado-Wyoming Chapter Annual Meeting "Incorporating Climate Change into Local Management Decisions". Loveland, Colorado, February 23-26, 2009.

Hansen, E. S., P. Budy. 2007. Spawn Creek restoration project: evaluating the effects of passive restoration on fish health. U.S. Geological Survey, Utah Cooperative Fish and Wildlife Research Unit, Annual Meeting. Logan, Utah, April 11, 2007.

PROFESSIONAL and ACADEMIC ACTIVITIES

Memberships

American Fisheries Society – Parent Society, Colorado-Wyoming Chapter and Bonneville (Utah) Chapter.

Ecological Society of America.

North American Benthological Society.

Trout Unlimited – Cache Anglers chapter.

Positions Held

Outreach Committee, Co-Chair. Fall 2009 – Summer 2011 – Program in Ecology, University of Wyoming.

Student Seminar Series Committee, Chair, Spring 2007-Spring 2009 – Program in Ecology, University of Wyoming.

Vice President, Fall 2008 – Spring 2009 –American Fisheries Society, Colorado-Wyoming Chapter, Student Subunit, University of Wyoming.

President, Fall 2006 – American Fisheries Society, Bonneville Chapter, Student Subunit, Utah State University.

Vice President, Spring 2006 –American Fisheries Society, Bonneville chapter, Student Subunit, Utah State University.

HONORS, AWARDS, and RECOGNITION

Board of Visitors Award. Department of Zoology and Physiology, University of Wyoming. April 2012.

Jackson Hole One Fly Foundation Dennis Andersen Memorial Scholarship. Department of Zoology and Physiology, University of Wyoming. April 2012.

Colorado/Wyoming Chapter of the American Fisheries Society Ron Remmick Memorial Scholarship. Department of Zoology and Physiology, University of Wyoming. April 2012.

Best poster. P. C. Gaskill, E. S. Hansen, and S. B. Gale. 2012. Brown trout (*Salmo trutta*) spawning patterns in an urban stream. American Fisheries Society, Colorado-Wyoming Chapter, Western Division Annual Meeting Wyoming "Ecosystem management in a Twitter world". Jackson Hole, Wyoming, March 26-29, 2012.

Jackson Hole One Fly Foundation Dennis Andersen Memorial Scholarship. Department of Zoology and Physiology, University of Wyoming. April 2011.

Colorado/Wyoming Chapter of the American Fisheries Society Ron Remmick Memorial Scholarship. Department of Zoology and Physiology, University of Wyoming. April 2011.

Dr. George E. Menkens Memorial Scholarship. Department of Zoology and Physiology, University of Wyoming. April 2010.

National Science Foundation EPSCoR Graduate Fellowship. Summer 2009. Summer PhD fellowship, Program in Ecology, University of Wyoming. April 2009.

Vern Bressler Scholarship. Department of Zoology and Physiology, University of Wyoming. April 2009.

Plummer Scholarship for Environment and Natural Resources Conservation and Management. Haub School of Environment and Natural Resources, University of Wyoming. April 2009.

Best poster. Hays, R. J., E. S. Hansen, and A. C. Senecal. 2009. Spatial and temporal patterns of brown trout (*Salmo trutta*) spawning in an urban stream. American Fisheries Society, Colorado-Wyoming Chapter Annual Meeting "Incorporating Climate Change into Local Management Decisions". Loveland, Colorado. February 2009.

Dennis Jespersen Memorial Scholarship. Department of Zoology and Physiology, University of Wyoming. April 2008.

Western Division Student Subunit of the Year, American Fisheries Society. President of Utah State University Student Subunit, Bonneville Chapter, American Fisheries Society. September 2007.

Travel Award AFS 137th Annual Meeting $1000, Western Division, American Fisheries Society. September 2007.

National Science Foundation EPSCoR Graduate Fellowship. Fall 2007, Summer 2008, and Spring 2009. First year PhD fellowship, Program in Ecology, University of Wyoming. August 2007.

Finalist, Research Assistant of the Year, Utah State University, Robins Awards. April 2007.

Terri Lynn Steel Scholarship, College of Natural Resources, Utah State University. April 2007.

College of Natural Resources Graduate Research Assistant of the Year, Utah State University. March 2007.

Utah State University, Department of Aquatic, Watershed, and Earth Resources, Tuition Award, $1418.64. August 2006.

Utah State University, Graduate Student Senate Travel Award, $300, to North American Benthological Society Annual Meeting, April 2006.

Special Project Award $1000, Tuition for Principles and Practice of Stream Restoration Short Course Part I, Utah State University. Bonneville Chapter of the American Fisheries Society. March 2006.

Award of Merit. Bonneville Chapter of the American Fisheries Society, Western Division Meeting. March 2004.

Phelps and Ware Scholarship. Department of Fisheries and Wildlife, Utah State University, Logan, Utah. Fall 1999 – Spring 2000.

Academic Scholarship. Department of Biology, Utah Valley State College, Orem, Utah. Fall 1997 – Spring 1998.

Academic Scholarship. Department of Humanities Arts and Social Sciences, Utah Valley State College, Orem, Utah. Fall 1996 – Spring 1997.

TECHNICAL TRAINING RECEIVED

Instream Flow Principles and Water Law Concepts for Fishery Managers. American Fisheries Society, Colorado – Wyoming Chapter. February 2013.

Aquatic Plant Identification Workshop. American Fisheries Society, Western Division. March 2012.

Planning and Executing Successful Rotenone and Antimycin Projects. American Fisheries Society-Task Force on Fishery Chemicals, Utah State University. May 2007.

The Principles and Practice of Stream Restoration Short Course Part I, Utah State University. May/June 2006.

Program R workshop. Utah State University. March 2006.

GIS Short Course. American Fisheries Society, Bonneville Chapter. March 2006.

Model Selection and Multimodel Inference Short Course. David R. Anderson. January 2006.

Conservation Genetics. American Fisheries Society, Bonneville Chapter. March 2005.

Fish Culture Class (12 Day Intensive Course, Classroom, Lab & Field). Utah Division of Wildlife Resources. March 2004.

Preparation and Review of Professional Manuscripts. American Fisheries Society, Western Division. March 2004.

"Point of Order"-Skills for Surviving General Robert's Rules. American Fisheries Society, Western Division. February 2004.

Microsoft Access 2002. Bridgerland Applied Technology College. Winter 2003–2004.

Fish Habitat Relationships in Managed Forests. Utah State University. Fall 2000.

TECHNICAL TRAINING PROVIDED

Science Posse Fellow – Bringing geographic information systems (GIS) into the classroom. Wyoming Math and Science Teacher's Conference, Casper College, Casper, Wyoming. October 15-16, 2012.

Coordinator and Teaching Assistant – Continuing Education Short Course, *for* Bonneville Chapter of the American Fisheries Society, March 19, 2007. Fish Bioenergetics.

SUSAN M. LONGEST, PH.D.

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EDUCATION

Ph.D., Evolutionary Biology, University of Chicago, Chicago, IL	2009
Certificate in University Teaching, University of Chicago, Chicago, IL	2009
M.S., Evolutionary Biology, University of Chicago, Chicago, IL	2005
B.S., Biology *(with honors & distinction in research)*, Cornell University, Ithaca, NY	2003

APPOINTMENTS

Assistant Professor, *Department of Biology*, Colorado Mesa University, Grand Junction, CO	2011-Present
Postdoctoral Fellow, *Department of Ecology & Evolutionary Biology*, Tulane University, New Orleans, LA	2011
Visiting Scholar, *Department of Ecology & Evolutionary Biology*, Tulane University, New Orleans, LA	2010-2011
Lecturer, *Department of Biology*, Cornell College, Mount Vernon, IA	2010
Fellow, *Institute for Mind and Biology*, The University of Chicago, Chicago, IL	2008-2009

RESEARCH EXPERIENCE

Colorado Mesa University, Grand Junction, CO 2013-Present
Assistant Professor
Project: Mapping Western Screech Owl Boxes using GIS
- Worked with Gigi Richard and Verner Johnson to train a student in GIS skills
- Currently creating a map of owl boxes in the Grand Valley for the owl count portion of Audubon's Christmas Bird Count

Colorado Mesa University, Grand Junction, CO 2012-Present
Assistant Professor
Project: Effects of Climate Change on the Breeding Biology of Tree Swallows and Violet-Green Swallows
- Analyzed historical records of tree swallow and violet-green swallow spring arrival dates using Audubon and ebird data
- Built 130 nest boxes according to the Golondrinas de las Americas protocol
- Currently locating breeding sites and monitoring reproductive behavior, as well as measuring temperature via ibuttons

Tulane University, New Orleans, LA 2010-2011
Visiting Scholar
Project: Deepwater Horizon Oil Spill Impacts on Louisiana Populations of the Brown Pelican
- Performed DNA extractions from blood samples and PCRs to analyze genetic data from local brown pelican populations
- Established a network of collaborators including local stakeholders, NGOs, state and federal organizations
- Wrote several grant proposals to fund field work on the breeding biology of local populations

Tulane University, New Orleans, LA 2010
Research Assistant
Project: Effects of the Deepwater Horizon Oil Spill on Population Dynamics of Blue Crabs
- Deployed crab larvae collectors at sites throughout Louisiana's coast, measured water temperature and salinity
- Identified crab larvae species from collectors at field sites along the Gulf of Mexico using a microscope and tracked the presence of droplets in the larvae that is thought to be related to the oil spill

Mesa State College and United States Geological Survey, Grand Junction, CO 2010
Research Assistant
Project: Land-Use Model of Population Growth in Mesa County, Colorado
- Researched and compiled historical real estate data from 1970 to 2010 in Mesa County, CO to be used in a land-use model to show the ways in which real estate choices affected land use and how land use also affected population growth

- Collaborated with researchers from Mesa State College and the U.S. Geological Survey to determine the types of data that should be collected for the model

University of Chicago, Chicago, IL 2003-2009
Graduate PhD Researcher
Project: The Development, Acquisition, and Maintenance of Dominance in Ring-tailed Lemurs
- Developed and executed an innovative comparative study of the behavioral and physiological correlates of dominance development, acquisition, and maintenance in free-ranging ring-tailed lemurs
- Collaborated with government officials, researchers, and NGOs to implement research project and create a network of international colleagues
- Collected nearly 3,000 hours of behavioral data at two field sites with different ecological factors and management
- Collected fecal samples and used hormone analysis techniques including pipetting, centrifuging, and performing enzyme immunoassays for testosterone and corticosterone metabolites
- Created and budgeted 10 successful grant applications for funding in excess of $132,000
- Hired, trained, mentored, and supervised research assistants, graduate students, and undergraduate students
- Managed a multi-year, multiple site database including behavioral and hormonal data
- Analyzed large data set using JMP, Excel, and Statview
- Presented results at domestic and international scientific meetings, and seminars for the general public

Caribbean Primate Research Center, Cayo Santiago, Puerto Rico 2004
Researcher
Project: Male Alliance Formation in Rhesus Macaques
- Executed a collaborative project studying alliance formation among male free-ranging rhesus macaques
- Maintained a large database including data from multiple researchers collaborating on the project
- Analyzed data using Minitab and Excel

Cornell University, Psychology Department, Ithaca, NY 2002
Research Assistant
Project: Behavioral Study of Vocalizations of the Endangered Silky Sifaka
- Transcribed field data into Excel for a graduate student's dissertation project on vocalizations of endangered silky sifakas in Madagascar
- Digitized aerial roars and zzuss vocalizations from audio recordings using PRAAT acoustical analysis software

National Institutes of Health, Poolesville, MD 2001
Research Assistant
Project: Maternal Aggression at Weaning in Rhesus Macaques
- Collected behavioral data from semi-free-ranging female and infant rhesus macaques at NIH's Animal Facility for a post-doctoral research project on maternal aggression at weaning
- Entered data into MS-DOS programs and assisted colleagues with their data entry
- Attended NIH-wide meetings, and seminars at the Animal Facility

Cornell University, Animal Science Department, Ithaca, NY 2000
Research Assistant
Project: Tannin Concentrations in the Diets of Ugandan Mountain Gorillas
- Assisted graduate student with her dissertation research on the tannin concentrations in the diets of Ugandan mountain gorillas
- Performed laboratory duties to assist with tannin extraction from leaves and vegetation consumed by the gorillas, including grinding vegetation with a mortar and pestle, using a sonicator, pipetting, and cleaning equipment

GRANTS AND AWARDS

Colorado Mesa University Faculty Professional Development Grant 2011-2012 (2), 2012-2013 (2), 2013-2014 (2)
$\beta\beta\beta$ National Biological Honors Society inductee 2013

GAANN Fellowship in Evolutionary Biology, University of Chicago	2008-2009
American Museum of Natural History/St. Catherines Island Foundation	2008
Hinds Fund, University of Chicago	2005-2006, 2007-2009
Institute for Mind and Biology Travel Fund, University of Chicago	2007
Student Research Grant, Animal Behavior Society	2007
Women's Board Travel Fund, University of Chicago	2006
Predoctoral Fellow, National Science Foundation	2004-2007
Small Research Grant, American Society of Primatologists	2004-2005
Morley Student Research Grant, Cornell University	2002-2003
Pamplin Leader Award, Virginia Tech	1999

PUBLICATIONS

Longest, S. M. *In Revision.* Social connectedness and social support in adult female ring-tailed lemurs.
Longest, S. M., Ottewell, K. M., Walter, S. T., Leberg, P. L., and Karubian, J. *In Prep.* The population structure of brown pelicans in the Gulf of Mexico.
Longest, S. M. *In Prep.* Baltimore Oriole. Colorado Breeding Bird Atlas II.
Longest, S. M. *In Prep.* Canvasback. Colorado Breeding Bird Atlas II.
Longest, S. M. *In Prep.* Hammond's Flycatcher. Colorado Breeding Bird Atlas II.
Longest, S. M. *In Prep.* Lesser Scaup. Colorado Breeding Bird Atlas II.

INVITED PUBLICATIONS

Longest, S. M. "The Trail Less Traveled." The Daily Sentinel, Birds and More Blog, September 2013.
Longest, S. Lemur Wrap-Up. *St. Catherines Island Foundation Newsletter*, July 2008.
Longest, S. Lemur Research. *St. Catherines Island Foundation Newsletter*, January 2008.
Longest, S. Lemur Land. *St. Catherines Island Foundation Newsletter*, September 2007.
Longest, S. Females Rule in Ring-Tailed Lemur Society. *St. Catherines Island Foundation Newsletter*, November 2006.

SELECTED PRESENTATIONS

(* indicates student presentation)
Oral Presentation – Junior Scientist Series, Mesa County Central Public Library, 2014
"Exploring bird diversity"

Oral Presentation – Grand Valley Audubon Society, Grand Junction, CO 2013
"Wildlife Conservation in South Africa"

Oral Presentation – Four Corners Conference, CMU, 2013
"Wildlife Conservation in South Africa"

Oral Presentation – Natural Resources Seminar Series, CMU, 2013
"The effects of climate change on the breeding behavior and migration patterns of birds and mammals"

Oral Presentation – Junior Scientist Series, Mesa County Central Public Library, 2013
"Animals of South Africa"

Teaching Workshop – Animal Behavior Society Meeting, Boulder, CO, 2013
"Building the ABS Education Portal and Teaching Resources Collection"

Poster Presentation – Animal Behavior Society Meeting, Boulder, CO, 2013
"Building the ABS Education Portal and Teaching Resources Collection"

***Poster Presentation**, Beth McBride– Animal Behavior Society Meeting, Boulder, CO, 2013
Undergraduate Student Genesis Poster Competition Participant
"The effects of climate change on the breeding behavior of tree swallows and violet-green swallows in western Colorado"

Oral Presentation – James M. Robb Junior Ranger Program, Grand Junction, CO, 2013
"Bird adaptations to their environments"

Oral Presentation – Saccomanno Internship Program in Biological Research, CMU, 2013
"Cover letters, CVs, and personal statements"

***Poster Presentation**, Beth McBride – Grand Valley Audubon Society Meeting, 2013
"The effects of climate change on the breeding behavior of tree swallows and violet-green swallows in western Colorado"

***Poster Presentation**, Beth McBride - *βββ* National Biological Honors Society Conference, CMU, 2013
"The effects of climate change on the breeding behavior of tree swallows and violet-green swallows in western Colorado"

***Poster Presentation**, Michael Partlow - *βββ* National Biological Honors Society Conference, CMU, 2013
"Comparing open source to commercial GIS programs for mapping Christmas Bird Count data"

***Poster Presentation**, Beth McBride – Student Showcase, CMU, 2013
"The effects of climate change on the breeding behavior of tree swallows and violet-green swallows in western Colorado"

***Poster Presentation**, Michael Partlow – Student Showcase, CMU, 2013
"Comparing open source to commercial GIS programs for mapping Christmas Bird Count data"

Oral Presentation – CMU Biology Club, 2012 and 2013
" Evolutionary approaches to behavior"

Poster Presentation – Animal Behavior Society Meeting, Albuquerque, NM, 2012
"The population structure of brown pelicans in the Gulf of Mexico"

***Poster Presentation**, Stuart Sinclair– Student Showcase, CMU, 2012
"The effects of climate change on the breeding behavior of tree swallows and violet-green swallows in western Colorado"

Oral Presentation – Junior Scientist Series, Mesa County Central Public Library, 2012
"Lemurs of Madagascar"

Oral Presentation – American Ornithological Union Meeting, Jacksonville, FL, 2011
"The population structure of brown pelicans in the Gulf of Mexico"

Oral Presentation, Allee Competition – Animal Behavior Society Meeting, Pierenopolis, Brazil, 2009
"Social connectedness and social support in adult female ring-tailed lemurs"

Ph.D. Dissertation Defense – University of Chicago, Chicago, IL, 2009
"Dominance in ring-tailed lemurs: Development, acquisition, and maintenance"

Oral Presentation – Science Chicago Junior Science Café Series, Glen Ellyn, IL, 2009
"Lemurs of Madagascar"

Oral Presentation – International Primatological Conference, Edinburgh, Scotland, 2008
"Behavioral and hormonal correlates of dominance acquisition of infant ring-tailed lemurs in a wild versus a food-provisioned population"

Oral Presentation – School for International Training Ecology and Conservation Course, Madagascar, 2006
Guest Speaker

RESEARCH STUDENTS

Cierra Wareham	2014 - Present
Tifany Rubalcaba	2014 - Present
Andy Ogrodny	2014 - Present
Michael Partlow	2013 - Present
Elliot Nahm	2013
Stephanie Hall	2013
Beth McBride	2012-2013
Stuart Sinclair	2012

TEACHING

Assistant Professor, Colorado Mesa University, 2011-Present:
BIOL 101 General Human Biology
BIOL 101L General Human Biology Lab

BIOL 106 Principles of Animal Biology
BIOL 106L Principles of Animal Biology Lab
BIOL 210 Human Anatomy and Physiology II
BIOL 210L Human Anatomy and Physiology II Lab
BIOL 341 General Physiology
BIOL 341L General Physiology Lab
BIOL 387 Structured Research
BIOL 412 Ornithology
BIOL 412L Ornithology Lab
BIOL 483 Senior Thesis
BIOL 496 Topics: Animal Social Behavior
SOCI 396: LGBT 101 (Interdisciplinary Course)

Co-Instructor, **Wildlife Ecology and Conservation,** South Africa with Canisius College, 2013
Instructor, **Diversity of Life Lab**, Tulane University, Spring 2011.
Instructor, **Vertebrate Zoology**, Cornell College, Spring 2010.
Instructor, **Principles of Biology** (2nd part of introductory biology sequence, included lab), Cornell College, Spring 2010.
Instructor and Co-organizer, **Workshop on Designing Evolution Courses**, University of Chicago, Spring 2009.
Graduate Teaching Consultant. Center for Teaching and Learning. University of Chicago, 2009.
Instructor (creator), **Approaches to Teaching in the Biological Sciences**, University of Chicago, Fall 2008.
Teaching Assistant, **Animal Behavior**, University of Chicago, Winter 2008.
Teaching Assistant, **Introduction to Biological Anthropology**, University of Chicago, Spring 2005.
Teaching Assistant, **Primate Evolution**, University of Chicago, Fall 2004.

PEDAGOGICAL TRAINING

Professional Development Workshop on *The NeXt Generation of College Students* led by Mark Taylor. CMU, Fall 2013.
Faculty Discussion Groups with President Tim Foster, CMU, 2012
Teaching Workshop on *What the Best College Teachers Do* led by Ken Bain. CMU, Summer 2012.
Faculty Workshop Training for the Learning and Study Strategies Inventory (LASSI). CMU, Fall 2011.
Teaching Workshop on *All You Need To Know About Teaching Writing*, led by writing expert Brad Hughes. Cornell College, Spring 2010.
Annual Spring Conference on Teaching. *Defining Your Academic Career: Toward An Integration of Teaching and Research*. Center for Teaching and Learning. University of Chicago, Spring 2009.
Teaching Workshop on *Collaborative Learning*. University of Chicago, Winter 2009.
Teaching Workshop on *Fostering Critical Thinking in Science*, led by biological pedagogy expert Craig Nelson. University of Chicago, Fall 2008.
Teaching Workshop on *Active Learning in the Classroom*. University of Chicago, Fall 2008.
Seminar & Workshop on *Course Design*. Center for Teaching and Learning. University of Chicago, Fall 2008.
Seminar & Workshop on *Teaching Portfolios*. Center for Teaching and Learning. University of Chicago, Summer 2008.
Annual Two-Day Workshop on *Teaching in the College*. Center for Teaching and Learning. University of Chicago, Fall 2008.
Teaching Assistant Training Course, University of Chicago, Fall 2004.

COMMITTEES AND REVIEWING ACTIVITIES

Undergraduate Curriculum Committee, CMU	2012-Present
Undergraduate Curriculum Committee, Subcommittee Point Person, CMU	2012-2013
Scientific Reviewer, Climate Literacy and Energy Awareness Network (CLEAN)	2013-Present
Scientific Reviewer, Animal Behavior Collection on EcoEd Digital Library	2013-Present
Ethics Reviewer, IACUC Committee, Animal Behavior Society	2013-Present
Development Committee, Animal Behavior Society	2013-Present
Mass Communications Search Committee (Outside Member)	2012-Present

Biology Search Committee for Vertebrate Biologist	2012-2013
Education Committee, Animal Behavior Society	2012-Present
Animal Behavior Online Teaching Portal Subcommittee, Animal Behavior Society	2012-Present
Chair of Citizen Science, Grand Valley Audubon Society, Grand Junction, CO	2012-Present
Biology Search Committee for Animal Physiologist	2012
Film Committee, Animal Behavior Society	2009-2010

ADVISING

Co-advisor, Fish and Wildlife Club, CMU	2013-Present
Mesa Experience Volunteer, CMU	2012-Present
Mav Scholars Event Volunteer, CMU	2013
Exploring a Major Fair Volunteer, CMU	2012
Advise 45-60 Biology undergraduate students each semester	2012-Present
Advising Orientation Session Volunteer, CMU	2011-Present

OUTREACH AND LEADERSHIP

Genesis Competition Undergraduate Poster Judge, Animal Behavior Society	2013
Area Count Leader, Grand Valley Audubon Society Spring Migratory Bird Count	2013
Oral Presentation Judge, *βββ* National Biological Honors Society Conference, CMU	2013
Science Fair Judge, Regional Western Colorado Science Fair	2013
Bird Walk Leader, Grand Valley Audubon Society	2013
Area Count Leader, Grand Valley Audubon Society Christmas Bird Count	2012, 2013
Founder and Organizer, Junior Scientist Series (with Mesa County Public Library)	2012-Present
Devil's Canyon Annual Scavenger Hunt, Colorado Canyons Association	2012-2013
5th Grade Science Fair Judge, Plateau Valley Elementary School	2012
On-Call Scientist, AAAS Science and Human Rights Program	2009-Present
Science Fair & Senior Promotion Presentation Judge, Young Women's Leadership Charter School of Chicago	2009
Prairie Restoration Volunteer, Chicago Parks District	2009
Sponsor, Women for Women International	2006-2009
Events Coordinator, Women in Science, University of Chicago	2004-2005
Instructor, Bio Outreach Program, Chicago, IL	2003-2004
Founder & President, Animal Behavior and Ethology Club, Cornell University	2001-2002
Member & Chemistry Tutor, Women in Science, Cornell University	2001-2002
Domestic Violence Hotline Volunteer, Task Force for Battered Women, Ithaca, NY	2001-2002
Participant, Student Leadership Conference, Cornell University	2001

REFERENCES

Dr. Denise McKenney, *Chair of Biology Department.* Department of Biology, Colorado Mesa University. E-mail: dmckenne@coloradomesa.edu, Telephone: (970) 248-1015

Dr. Jill Mateo, *Chair of Doctoral Committee.* Associate Professor, Department of Comparative Human Development, The University of Chicago. E-mail: jmateo@uchicago.edu, Telephone: (773) 834-9848.

Dr. Sue Margulis, *Doctoral Committee Member and Co-instructor.* Assistant Professor, Department of Animal Behavior, Ecology and Conservation, Canisius College. E-mail: margulis@canisius.edu, Telephone: (716) 888-2773.

Dr. Craig Tepper, *Chair of Biology Department.* Professor, Department of Biology, Cornell College. E-mail: ctepper@cornellcollege.edu, Telephone: (319) 895-4376.

Dr. Iglika Pavlova, *Co-organizer of Evolution Workshop.* Lecturer, Biological Sciences Collegiate Division, The University of Chicago. E-mail: iglikap@uchicago.edu, Telephone: (773) 702-0683.

Name:

Denise S McKenney

Start Year: 1996

Program:
Biological Sciences

Department:
Biological Sciences

COLORADO MESA UNIVERSITY

Full-time Faculty Vita

Faculty Rank

(•) Professor ( ) Assistant Professor

( ) Associate Professor ( ) Instructor

Highest Degree

PhD	North Carolina State University-Raleigh	Microbiology	1986

Education: (List all degrees beginning with most recent-include post docs and external certificates)

PhD, Microbiology, North Carolina State University, 1986

Secondary Education Certification in Biology and Chemistry, New Mexico State University, 1979

BS in Biology, New Mexico State University, 1978

Teaching 2003-Present:

Courses Taught

BIOL 105 Attributes of Living Systems
BIOL 105L Attributes of Living Systems Laboratory
BIOL 301 Genetics
BIOL 301L Genetics Laboratory
BIOL 350 Microbiology
BIOL 350L Microbiology Laboratory
BIOL 425 Molecular Biology
BIOL 496 Topics in Virology

Evidence of Continuous Improvement

Paul Gaston Degree Qualifications Profile, January 5-6, 2012
Patty Phelps Restoring the Joy of Teaching and Ways to Promote Learning, January 16, 2010
Barbara Millis Course Redesign and Revitalization, January 16, 2009
Ed Neal Critical Thinking, May 1-2, 2008
Diane Nyhammer Assessment, January 2008
Linda Neilson Workshops, May 3-4, 2007

Supervision of Student Research/Project(s)

Nitrogen fixation in cave bacteria, supervised one student, 2006
Supervised two student investigating nitrogen fixation genes from samples collected from the Spring Cave. Soil samples were plated on TSA agar, DNA isolated and PCR analysis performed with 16S rRNA primers, 2005
Initiated research on nitrogen ecology in cave bacteria, supervising one student, 2004

Scholarship and Creative Work, 2003-Present:

Scholarship Related to Discipline

Scholarship Related to Pedagogy in Discipline

Lab Manual: BIOL 105L Attributes of Living Systems Laboratory Manual, FountainHead Press, 2006
Second Edition of lab manual: 2011

Professional Memberships
Sigma Xi
American Society for Microbiology

Service 2003-Present:
University
Appeals committee
MASH camp presenter 2008, 2009
Search committee member for Teacher Education, 2008

Department
Department Head 2005-present
Laboratory coordinator for all sections of BIOL 105L Attributes of Living Systems Laboratory, 2005-present
Pre-med club co-advisor, 2003-2005

Community
Saccomanno Research Institute Oversight Committee, 2003-present

Local
Science Fair Judge: 2003-present
Science Fair Committee: working with District 51, 2005-2006

Advising 2003-Present:
University level
Multiple SOAR and advising sessions: every year

Department level
About 30 advisees each year

Honors and Awards 2003-Present:

Professional Experience:
Department Head of Biological Sciences
Colorado Mesa University, Grand Junction, Colorado
August 2005-present

Professor. Department of Biological Sciences
Colorado Mesa University, Grand Junction, Colorado
August 2001-present

Please record the number "items/events" you have listed above in the following categories.
If you specify items/events under "other," please provide an explanation/definition.

Books	**Book Reviews**	**Creative Publications**
Journal Articles	**Performances**	**Patents**
Conference Presentations	**Exhibitions**	**Grants-funded and non-funded**
Sabbaticals	**Fullbright**	**Book Chapter**
Other (related to discipline)	BIOL 105L Attributes of Living Systems Lab Manual	

Kyle J. McQuade, Ph.D.

Associate Professor of Biology
Colorado Mesa University
1100 North Avenue
Grand Junction, CO 81501
970.248.1650
kmcquade@coloradomesa.edu

EDUCATION and EXPERIENCE

Colorado Mesa University, Grand Junction, CO	
• Associate Professor of Biology	2013-present
• Assistant Professor of Biology	2006-2013
Princeton University, Princeton, NJ.	2003-2006
• Postdoctoral teaching and research fellow, Department of Molecular Biology and Council for Science and Technology	
University of Wisconsin-Madison, Madison, WI.	2003
• Ph.D. in Cellular and Molecular Biology	
Millikin University, Decatur, IL.	1996
• B.S. in Biology and Chemistry, *magna cum laude*	

TEACHING

TEACHING EXPERIENCE

Colorado Mesa University.	2006-present
Postdoctoral Teaching Fellow. Princeton University.	2003-2006
Research Mentor for Undergraduates, Princeton University.	2004-2005
Teaching Assistant. University of Wisconsin-Madison.	2001
Research Mentor for Undergraduates. University of Wisconsin.	2000-2001
Rotation Mentor. University of Wisconsin.	1997-2001

TEACHING INTERESTS

- Implementing novel, inquiry-driven experimentation in the teaching laboratory
- Using the primary literature as a teaching tool
- Emphasizing the importance of writing in science
- Philosophy of science

COURSES TAUGHT

- General Human Biology Laboratory BIOL101L
- Attributes of Living Systems – BIOL105/BIOL105L
- Quantitative Molecular Biology – MOL215 (at Princeton University)
- Cellular Biology – BIOL302/BIOL302L
- Immunology – BIOL343/BIOL343L
- ‡Forensic Molecular Biology – BIOL344/BIOL344L
- ‡Laboratory Investigations in Cellular and Molecular Biology – BIOL371L
- Structured Research – BIOL387
- Topics: Cancer Biology – BIOL396
- Molecular Genetics – BIOL425
- Endocrinology – BIOL441
- Senior Thesis – BIOL483
- Senior Research – BIOL487
- Lab Teaching Practicum – BIOL493
- ‡Current Topics in Biomedical Research – BIOL496
- Methods in Teaching Secondary Science – EDUC497D
- ‡Middle School Biology – EDUC596

‡ new course developed at Colorado Mesa University

RESEARCH/SCHOLARLY ACTIVITY

RESEARCH EXPERIENCE

Undergraduate Research Mentor. Colorado Mesa University.	2006-present
Post-doctoral Research. Princeton University.	2003-2006
Doctoral Thesis Research. University of Wisconsin.	1997-2003
Undergraduate Thesis Research. University of Wisconsin.	1995-1996
Undergraduate Research Project. Carnegie Mellon University.	1994

RESEARCH INTERESTS

- Characterization of the molecular machinery controlling cell motility and metastasis
- Regulation of G-protein signaling
- Mechanisms of protein localization
- Drug discovery and characteriztion
- Training students in the mechanisms of scientific inquiry

RESEARCH STUDENTS MENTORED AT CMU

- Kevin Wernke – 2013-present – "*Dictyostelium* chemotaxis as a drug discovery tool."
- Kayt Hawley – 2013-present - "*Dictyostelium* chemotaxis as a Tool to Characterize Bioactive Natural Compounds."
- Sunni Rae Baird – 2012-2013 – "The effects of EGCG on Morphogenesis in *Dictyostelium*."
- Sarah Wood – 2012-present – "Effects of EGCG on Cell Motility"
- Tim Moore – 2011-2012 – "Using *Dictyostelium* as a screening tool for Bioactive Natural Compounds"
- April Ilacqua – 2011-present – "Characterizing the Effects of EGCG in *Dictyostelium*"
- Sarah Wilson – 2010-2011 - "Effects of Green Tea Extracts on *Dictyostelium* Growth"
- Tina Peltier – 2010-2012– "Effects of Green Tea Extracts on *Dictyostelium* Development"
- Joshua Bollan – 2008-2010 -"Role of G-protein methylation in endocytosis"
- Julie Fritz – 2008 – present - "Role of G-protein methylation in cytokinesis"
- Kathryn Bailey – 2007-2010 – "Role of G-protein methylation in *Dictyostelium* chemotaxis"
- Shannon Piersall – 2008 – "Role of G-protein methylation in endocytosis"
- Brad Winters – 2007-2008 "Role of isoprenylcysteine methylation of G-protein localization"
- Everett Austin – 2006-2007 – "Role of heparan-sulfate proteoglycans in keratocyte motility"

PEER-REVIEWED RESEARCH PUBLICATIONS

‡McQuade, K.J, Nakajima, A., Ilacqua, A.N., Shimada, N. and S. Sawai. 2013. The green tea catechin epigallocatechin gallate (EGCG) blocks cell motility, chemotaxis and development in *Dictyostelium discoideum*. *PLOS ONE*. 8: 3. e59275.

‡Chen, Y.*, McQuade, K. J.*, Guan. X. J., Thomason, P. A., Wert, M. S., Stock, J. B. and E. C. Cox. 2007. Isoprenylcytseine carboxyl methylation is essential for development in *Dictyostelium discoideum*. *Mol. Biol. Cell.* **18:** 4106-4118.

McQuade, K. J.*, Beauvais, D.M.*, Burbach, B.J. and A. C. Rapraeger. 2006. Syndecan-1 regulates $\alpha_v\beta_5$ integrin activity in B82L fibroblasts. *J. Cell Sci.* **119:** 2445-56.

McQuade, K. J. and A. C. Rapraeger. 2003. The syndecan-1 transmembrane and extracellular domains have unique and distinct roles in cell spreading. *J. Biol. Chem.* **278:** 46607-15.

Lebakken, C. S., McQuade, K. J. and A. C. Rapraeger. 2000. Syndecan-1 signals independently of β_1 integrins during raji cell spreading. *Exp. Cell Res.* **259:** 315-325.

Svitkina, T., Verkhovsky, A., McQuade, K. and G. Borisy. 1997. Analysis of the actin-myosin II system in fish epidermal keratocytes: mechanism of cell body translocation. *J. Cell Biol.* **139:** 397-415.

‡ published while at Colorado Mesa University

* co-first authors

PUBLISHED ABSTRACTS

‡McQuade, K.J, Nakajima, A., Ilacqua, A.N., Shimada, N. and S. Sawai. 2012. Epigallocatechin-3-gallate (EGCG) blocks development of *Dictyostelium discoideum*. *Mol Biol Cell* .23 (supplement), Abstract 904.

‡McQuade KJ, Bollan J, Bailey K, Fritz J 2011. Isoprenylcysteine methylation is required for growth and endocytosis in *Dictyostelium discoideum*. *Mol Biol Cell.* 22 (supplement). Abstract 2036.

‡Bollan, J., Bailey, K., Fritz, J., and K.J. McQuade. 2010. Isoprenylcysteine methylation is required for normal growth and endocytosis in *Dictyostelium*. *The Journal of the Colorado-Wyoming Academy of Science*. **40:** 5. (abstract)

McQuade, K. J. and A. C. Rapraeger. 1999. Syndecan-1 mediates filopodial extension in B82L fibroblasts. *Mol. Biol. Cell.* **10s:** 451a. (abstract)

Svitkina, T., Verkhovsky, A., McQuade, K. and G. Borisy. 1996. Organization and dynamics of myosin II in locomoting and stationary fish epidermal keratocytes. *Mol. Biol. Cell.* **7s:** 560a. (abstract)

Verkhovsky, A., Svitkina, T., McQuade, K. and G. Borisy. 1996. Polarity of fish epidermal keratocytes. *Mol. Biol. Cell.* **7s:** 231a. (abstract)

‡ published while at Colorado Mesa University

DOCTORAL THESIS

McQuade, K. J. 2003. Roles of syndecan-1 in cell adhesion and signaling. doctoral thesis – University of Wisconsin-Madison.

PUBLISHED ESSAYS

‡Four short essays have been published in Salem Health:Cancer, an encyclopedia for patients. The encyclopedia was published in 2008.

Amyloidosis
APC gene testing
DPC4 gene testing
HRAS gene testing

in: Knight, White-Ryan and Jackson-Grusby. Salem Health:Cancer. Pasadena, CA: Salem Press, 2008.

‡Two short essays have been published in Salem Health:Genetics and Inherited Disorders. The encyclopedia was published in 2010.

Gm1-gangliosidosis
Wiskott-Aldrich syndrome

PATENTS

‡Cox, E.C., Stock, J.B., Chen, Y., McQuade, K.J. and S. Sawai. Integrated Screening Assays and Methods of Use. Published by US Patent and Trademark Office, Mar 4, 2010. Publication number US 2010/0056391 A1.

‡ submitted while at Colorado Mesa University

POSTER PRESENTATIONS

†Annual Meeting of the American Society for Cell Biology, San Francisco, CA. 2012.

†Annual Meeting of the American Society for Cell Biology, Denver, CO. 2011. Isoprenylcysteine methylation is required for growth and endocytosis in *Dictyostelium discoideum*. Mol Biol Cell 22, 4705 (abstract 2036).

†Annual International Dictyostelium Conference, Estes Park, CO. 2009. Isoprenylcytsteine methylation is required for normal growth and endocytosis in *Dictyostelium*.

Meeting of the American Society for Matrix Biology, Houston, TX. 2002. The syndecan-1 transmembrane domain signals spreading via a mechanism involving lipid rafts.

Meeting of the American Society for Cell Biology, Washington, D. C. 1999. Syndecan-1 mediates filopodial extension in B82L fibroblasts.

† presented while at Colorado Mesa University

PRESENTATIONS by MSC STUDENT RESEARCHERS

April Ilacqua -TriBeta National Conference – San Juan, PR – 2012 (2nd place oral presentation)
- TriBeta Regional Conference – Adams State College – 2012 (2nd place oral presentation)
- CMU Student scholars symposium, 2012 (1st place oral presentation)

Sarah Wood
Sunni Baird
Tina Peltier - TriBeta Regional Conference – Western State College – 2011

Sarah Wilson - TriBeta Regional Conference – Western State College – 2011

Joshua Bollan - Colorado and Wyoming Academy of Science Annual Meeting – Mesa State College - 2010

Julie Fritz - TriBeta Regional Conference – Western State College – 2011
- TriBeta Regional Conference – Mesa State College – 2010 (poster – 2nd place award)
- Western Regional Honors Council Conference – Spokane, WA, 2009
- TriBeta Regional Conference – Ft. Lewis College, 2009 (2nd place oral presentation)
- MSC Student scholars symposium, 2009

Katie Bailey - TriBeta Regional Conference – Ft. Lewis College, 2009

Brad Winters - TriBeta Regional Conference – CSU-Pueblo, 2008
- MSC Student Scholars Symposium, 2008

Everett Austin – MSC Student Scholars Symposium, 2007

FUNDING at COLORADO MESA UNIVERSITY

Grants Awarded:	amount received
National Science Foundation-Major Research Instrumentation – Awarded Septemeber, 2009 – AWARD #0923233 – Principal Investigator	$265,201
National Science Foundation-Major Research Instrumentation -R^2 – MRI-R2: Acquisition of a Digital Stereomicroscopy System for Research, Research Training and the Integration of Research and Education at Mesa State College. Awarded April, 2010. AWARD #0960178. Principal Investigator	$23,055
Saccomanno Higher Education Foundation – Summer Internship in Biological Research – 2012 - 2014	$94,500
American Philosophical Society – Franklin Grant – 2008 - Principal Investigator	$5,000
CMU Faculty Professional Development Award –2007-2008	$2,183
CMU Faculty Professional Development Award – 2009-2010	$1,280
CMU Faculty Professional Development Award – 2010-2011 (co-principle investigator)	$3,000
CMU Faculty Professional Development Award – 2011-2012	$2,220
CMU Faculty Professional Development Award – 2012-2013	$2,466
CMU Faculty Professional Development Award – 2013-2014	$1986

Proposals Submitted:	amount requested
American Society of Pharmacognosy – Research Starter Grant – Spring 2011	$4300
Boettcher Foundation – Webb-Waring Biomedical Research Awards Early Investigator Program – April 2010	$255,000
Research Corporation – CCSA – Fall 2008	$25,572

Undergraduate Research Awards:	amount received
Brad Winters, 2007-2008	
Tri-Beta Research Scholarship - 2007	$560
Sigma Xi Grant in Aid of Research - 2007	$730
Katie Bailey, 2008- 2010	
Tri-Beta Research Scholarship - 2008	$400
Julie Fritz, 2008- 2010	
Tri-Beta Research Scholarship - 2010	$425
Tri-Beta Research Scholarship - 2009	$450
Tri-Beta Research Scholarship – 2008	$400
Sarah Wilson, 2010-2011	
Tri-Beta Research Scholarship – 2010	$450
Tina Peltier, 2010-2011	
Tri-Beta Research Scholarship – 2010	$425
April Ilacqua – 2011-	
Tri-Beta Research Scholarship – 2012	$408
CMU Biology Student Research Award – 2011	$408
Tri-Beta Research Scholarship – 2011	$650
Tim Moore – 2011	
CMU Biology Student Research Award – 2011	$650
Sarah Wood - 2012	
Tri-Beta Research Scholarship – 2012	$548
Sunni Rae Baird - 2012	
Tri-Beta Research Scholarship – 2012	$303

Funding Summary

Funds Requested from Extramural Agencies:	$681,311
Awards Received at MSC:	$400,891
Awards Granted to Undergraduate Researchers:	$6,807

SERVICE

CAMPUS COMMITTEES

Assessment Committee, 2007-present
Academic Technology Advisory Council, 2009-present
Academic Dishonesty Committee – July 2010
Biology/PES Scholarship Committee – 2011-present
HLC Reaccreditation Committee – academic rigor – 2011-present
General Education Revision Committee – 2012-present

HIRING COMMITTEES

Molecular Genetics Job Search, 2014
Chemistry Job Search, 2014
Biochemistry Job Search, 2011
Developmental Biology Job Search, 2011
A&P Biology Job Search - chair (two positions), 2010
Analytical Chemistry Job Search, 2008
Plant Biology Job Search, 2007

BIOLOGY DEPARTMENT COMMITTEES

Department Representative - APQPP Programs of Distinction Action Plan, 2009
Curriculum Review Committee, 2007

CAMPUS SERVICE

Faculty Co-advisor, Biology Club 2008-present
Organizer – Biology Department Faculty/Student Research Meetings, 2008-2010
Secretary – Sigma Xi National Research Society, Mesa State College Chapter, 2008-2010
Guest Lecturer in General Organismal Biology Lab 2007, 2011, 2012; Criminalistics 2007, 2010; Mycology 2009, 2011, 2013; Molecular Cloning 2010; Genetics 2011
Guest Lecturer in 2013 CMU Physics Symposium
Judge, 2008 Student Scholars Symposium
Panelist, CMU New Faculty Orientation Teaching Effectiveness Panel Discussion, 2013

OUTREACH, COMMUNITY SERVICE, PROFESSIONAL SERVICE

NSF Review Panelist - 2013
Reviewed Principles of Life by Hillis, Sadava, Heller and Price - professional review for Sinauer and Associates - 2013
Selection Committee – Saccamanno Research Institute Internship, 2011-2013
Reviewed Biology by Brooker, Widmair, Graham and Stiling – professional review for McGraw-Hill Publishing - 2011
Taught in MS3 Program – training for District 51 master teachers – 2010-present
Local Scientific Member – St. Mary's Regional Medical Center – Institutional Biosafety Committee, 2010
Science Fair Judge
Wingate Elementary School 2007
Western Colorado Science Fair 2007 – 2008, 2010
Judge for Tri-Beta Regional Meeting
Oral Presentations – 2008 meeting at CSU-Pueblo
Poster Presentations – 2009 meeting at Ft. Lewis College
Poster Presentations – 2012 meeting at Adams State College
Presented research talk to FMHS AP Biology students – 2010
Presented research talk to GJHS AP Biology students - 2009

ADVISING

SOAR ADVISOR

July 22, 2011
May 20, 2011
November 20, 2010
May 28, 2010
May 2, 2009
April 25, 2009
June 6, 2008
May 30, 2008
August 10, 2007
July 20 2007
December 2, 2006

ACADEMIC ADVISING

- I am currently primary academic advisor for approximately 70 biology majors.
- I regularly meet with students to discuss course selection and academic planning.
- I e-mail all of my advisees each semester to encourage them to meet with me.

CAREER COUNSELING

- I have provided informal career counseling to numerous biology students including research students, advisees and others who are not my assigned advisees.

LETTERS OF RECOMMENDATION

- I have submitted more than fifty letters of recommendation for students seeking admission to medical school, the nursing and teacher education programs, summer undergraduate research programs, intramural and extramural scholarships, etc.

AWARDS

Distinguished Faculty Award – 2013
Exemplary Performance Rating – 2009, 2010, 2011, 2012
Excellent Rating on Faculty Personnel Ratings – 2007-2012
President's Parking Award – November 2012

VITA 2010

CARRIE MCVEAN WARING, DVM

Professor of Biology
Mesa State College
272 Wubben Hall
1100 North Ave
Grand Junction, CO 81501
(970) 248-1165
cmcvean@mesastate.edu

Education

DVM. Doctor of Veterinary Medicine
Colorado State University
Fort Collins, CO. 80523
Graduated: May 1988
State Licenses: Colorado, Oregon, Nevada.
Elective courses of study include: Laboratory & exotic animal medicine

Bachelor of Science, Major: Veterinary Science
Colorado State University
Fort Collins, CO. 80523
Graduated: May 1985
Field of study: Animal Sciences and Biochemistry

Teaching Experience

Current : Professor of Biology, MSC (F2006-present)

Associate Professor of Biology, School of Natural Sciences & Math MSC (F2001-2006)

Assistant Professor of Biology, School of Natural Sciences and Mathematics, Mesa State College (F96-Sp 2001)

Instructor, School of Natural Sciences and Mathematics, Mesa State College (F94-Sp96)

Instructor, Department of Agriculture, Mesa State College (F93-Summer94)

Undergraduate Supervised College Teaching,
Colorado State University (Sp84)

Courses Instructed

Biol 416, Co-taught Ethology
Course discussed the relationship between anatomical systems and behavior.

Biol 396-Topics on AIDS
Course covers biology of HIV, course of the disease, risk factors and prevention.

Biol 101, General Biology Lecture and Laboratory
Introductory Biology course required as a general education course for non-biology majors. Pertinent subject matter covered.

Biol 209/141 Human Anatomy and Physiology Lecture and Lab I
Introductory course which covers physiology of human organ systems. The laboratory teaches anatomy of human and cat organ systems.

Biol 210/145 Human Anatomy and Physiology Lecture and Lab II
Second semester course of A&P which covers material not previously covered in Biol 141.

Biol 250 Microbiology Laboratory
Practical laboratory course which explores bacterial properties, sterile techniques for microbiological handling and safety are stressed to prepare student for laboratory work.

Agri 225, Agriculture Business Records\Analysis
Basic record keeping, balance sheets, income statements, labor costs and financial analysis,

Agri 254, Livestock Feeding and Laboratory
Animal nutrition, digestive system physiology, feed analysis and how to balance a daily livestock ration.

Agri 211, Introduction to Range Science
Range classification, soils, plant identification, stocking rate determination skills and range management practices. Laboratories involved interaction with field experts from the Soil Conservation Service & Bureau of Land Management.

Agri 265, Agricultural Marketing
Covered principles of marketing, marketing system framework, commodities marketing and putting together marketing plans.

Agri 116 Basic Agricultural Skills and Laboratory
A variety of agricultural skills, soil assessment, livestock reproduction physiology and herd health records

Agri 101, Agricultural /Natural Resource Occupations
Career and job hunting skills, resume writing, methods to determine personnel interests and how to obtain career objectives.

Supervised Undergraduate Teaching- Advisor; Dr. John Pexton
Taught animal reproduction laboratories for the CSU Department of Animal Sciences. Topics included; anatomy, physiology, histology and endocrinology of livestock reproduction.

Professional Working Experience

Professor of Biology, Department of Natural Sciences and Mathematics, Mesa State College, Grand Junction, Colorado, 81502 8/15/94-present
(970) 482-1165

Instructor, Department of Agriculture, Mesa State College,
Grand Junction, CO 81502 8/18/93-8/15/94

Veterinarian, Bookcliff Veterinary Hospital
564 29 Road, Grand Junction, CO. 81501 1993
(303) 243-3339

Emergency Veterinary Clinician, Emergency Veterinary Hospital
2050 Centennial Boulevard, Eugene, Oregon, 97410 6/92-4/93
(503) 485-0932

Relief Veterinarian, Self employed in Portland, Oregon.
2062 NW Marshall, Portland, Oregon 97209 9/91-7/92

Clinical Veterinarian and Manager, Animal Medical Clinic
1411 SW 14th, Portland, Oregon, 97202 10/89-9/91
(503) 222-1254

Clinical Veterinarian, Tropicana Veterinary Clinic,
2385 E. Tropicana, Las Vegas, Nevada, 89119 8/88-6/89
(702) 736-4944

Professional Affiliations

Colorado State Board of Veterinarians, License 1988-Current
Continuing Education Credits-Current
Association of Laboratory Animal Clinicians-Current
DEA license for Controlled Substances- Current
VECCS, Veterinary Emergency Care Clinicians Society 1992-1995 Grand Junction Veterinary Association 1993-1994
AVMA, American Veterinary Medical Society 1988-1989
Nevada Board of Veterinary Examiners, License 1988-1994
Oregon Board of Veterinary Examiners, License 1989-1995
SAVMA, Student American Veterinary Medical Society 1984-1988

Scholarship Continuing Education Courses

Western States Veterinary Conference, Las Vegas, Nevada. 1990

Principles of Surgery, Seattle, Washington. 1991

Veterinary Emergency Care Clinicians Conference,San Antonio, Texas. Fall 1992

Computers in our Society, Mesa State College, 1993

Swine Artificial Insemination, Mesa State College, 1993

Cow and Calf Nutrition, Colorado State University, 1994

Veterinary Emergency Care Clinicians Conference, Puerto Vallarta, Mexico. October 12-16, 1995

The Human Anatomy and Physiology Society, Toronto Canada, May 31-June 5, 1997

Diagnostics iu Exotic Animal Practice, Colorado State University,June 11-13, 1997

ADAM Software Grant Writing Symposium, Denver, CO June 1997 Attendance at symposium allowed MSC to be elgible for a $20,000 Adam Software grant. Grant was not awarded to MSC

Biotechnology Theory and Practice, Northern Illinois University,June 1-3,1998

Biotechnology for Interdisciplinary Sciences, Northern Illinois Univ. June 4-6, 1998

Ecology of the Rockies, Mt. Evans Field station, July 26-30, 1998

American Veterinary Medical Association(AVMA) Annual Conference, SLC, Utah, July 22-26, 2000

6th Annual Current Laboratory Animal Science Seminar & 47th Annual Pathology of Laboratory Animals(POLA), Rockville, MD 2001

AVMA Meeting –Minneapolis MN. -32 credit hours of Continuing education
Maintain Colorado Veterinary license June 2004

Biosafety & Biosecurity training – Four day conference covering the management and design of level 2 & 3 bio-safety level facilities. Colorado State University July 2005

Service

Membership 1996

Who-Who Committee(ended 2002)
Search Committee's
Continuing Ed. Director
Biology Faculty- chaired ecology search
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals

Membership 1997

Chair & Veterinarian, Animal Care and Use Committee (ACUC)
Tri-Beta Honor Society Member
Biology Club/Tribeta; attend annual Regional Conferences
Junior Service League (JSL)(ended 2001)
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
Who-Who Committee(ended 2002)

Membership 1998

MSC Faculty Senate member
MSC Safety Committee(ended 2002)
Biology Club co-Advisor
Tri-Beta Biological Honor Society hosted; Tri-Beta Regional Conference
Wilderness Coalition
Audnbon Society- Board member (ended 1999)
Junior Service League (JSL)(ended 2001)
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
Who-Who Committee(ended 2002)

Membership 1999-2000

MSC Faculty Senate member
Vice-President 2002-2003
MSC Safety Committee(ended 2002)
Biology Club co-Advisor
Tri-Beta Biological Honor Society hosted; Tri-Beta Regional Conference
Wilderness Coalition
Audubon Society- Board member (ended 1999)
Junior Service League (JSL)(ended 2001)
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
Who-Who Committee(ended 2002)
American Association of University Professors (AAUP)

Membership 2001-2003

Redlands Mosquito Control Board
MSC Faculty Senate member
Vice-President 2002-2003
FACT representative 2002-2003
MSC Safety Committee(ended 2002)
Biology Club co-Advisor
Tri-Beta Biological Honor Society
Wilderness Coalition
Junior Service League (JSL)(ended 2001)
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
Who-Who Committee(ended 2002)
American Association of University Professors (AAUP)

Membership 2004-2010

GRMCD Grand River Mosquito Control District
Biology Club co-Advisor
Tri-Beta Biological Honor Society hosted; Tri-Beta Regional Conference 2005
Science fair -Scientific Review Committee
Science Fair Judge- Botany & Junior Finals
American Association of University Professors (AAUP)
Academic Policies
Faculty Searches (Botany & Cell Biologist)
Equipment Committee
Travel Committee
Anatomy & Physiology Re-organization Chair

MSC Animal Housing Facility

Veterinarian, Animal Care and Use Committee
Committee is responsible for formulating Animal Care Policy which has been published in a booklet;

MSC Animal Care Handbook editor.
Edited handbook for IACUC. Committee approves/ rejects animal use protocols and oversees the care of animals in the facility.

Doctor of Veterinary Medicine
Responsibilities include:
Assisting Principle investigators in laboratory experiments
Treating sick or injured animals
Overseeing the health of animals in the facility
Maintaining treatment records

Research & Publications

Biological Experiences; A Laboratory Manual for Biology 101L
Fountainhead Press 2006

MSC Animal Care Handbook editor.
Edited handbook for IACUC. Committee approves/ rejects animal use protocols and oversees the care of animals in the facility. 2002

Clinical Practice, Various Veterinary Clinics
Skilled in multiple surgical procedures, anesthesia techniques, venipuncture, diagnostics and handling of a variety of animal species.

Laboratory Technician, Colorado State University Bull Farm
Fort Collins, Colorado, 80523. 8/82 - 5/84 Assisted with electro-ejaculation, semen collection and evaluation of sperm, processed and stored straws for artificial insemination.

Technician, Colorado State University Embryo Transfer
Fort Collins, Colorado, 80523. 5/83 - 9/83 Assisted in laboratory, observed embryo transfer procedure, evaluated cows for signs of stage of estrus.

Externship, Raptor Research and Rehabilitation
University of Minnesota, Saint Paul, Minnesota, 55108. 10/87 Necropsied raptors to determine cause of death.

Aparna Dileep~Nageswaran Palmer, Ph.D.

PERSONAL

	Office	Home
Address:	Biological Sciences Mesa State College Grand Junction, CO 81501	2217 Mescalero Ave. Grand Junction, CO 81503
Telephone:	(970) 248-1984	(970) 263-4148
E-mail address:	aparna@mesastate.edu	
Date and Place of Birth:	January 21, 1970 in Srirangam, India	
Citizenship:	United States of America	

EDUCATION

Ph.D. in Zoology, Department of Zoology, Washington State University, Pullman, Washington. Molecular Phylogenetics and Character Evolution of Polychaetous Annelids and their Allies. August 1999. Thesis Advisor: P.C. Schroeder.

B.A. in English, *magna cum laude*. Department of English, Colorado State University, Fort Collins, Colorado. May 1993.

B.S. in Biological Sciences, *cum laude*. Department of Biology, Colorado State University, Fort Collins, Colorado. May 1993.

PROFESSIONAL EXPERIENCE

Director, Academic Honors Program. Fall 2005-present.

Associate Professor, Department of Biological Sciences, Mesa State College. Instructor in Principles of Animal Biology, Marine Biology, Marine Invertebrate Communities, General Biology, Evolution, Freshman Year Initiative, Invertebrate Zoology, Nature of Science, Natural History of the Pacific Northwest Coast, Senior Thesis, and Attributes of Living Systems. Fall 2004-present.

Assistant Professor, Department of Biological Sciences, Mesa State College. Fall 1999-Spring 2003.

Graduate Teaching Assistant, Department of Zoology, Washington State University. Teaching Assistant in Invertebrate Zoology, Developmental Biology, Contemporary Issues in Biology, Cell Physiology, Introductory Biology, and General Zoology. Fall 1994-Summer 1999.

Visiting Academic Faculty Member, Department of Biological Sciences, University of Idaho. Lecturer in Invertebrate Zoology. Spring 1996.

Instructor, Department of Arts and Sciences, Morgan Community College, Fort Morgan, Colorado. Instructor of Speech Communication and Advanced Writing Skills. Spring 1994.

ESOL (English to Speakers of Other Languages) Program Coordinator and Lead Teacher, Morgan Community College, Fort Morgan, Colorado. Supervisor and Lead Teacher of the Intensive English Program. August 1993-May 1994.

Professional Experience, continued

Undergraduate Lecture and Laboratory Teaching Assistant, Honors Biology, Department of Biology, Colorado State University. Designed and taught labs on Invertebrate Zoology, Freshwater Ecology, Plant and Animal Biology, and Nature Writing. August 1988-May 1993. Advisor: M. Nabors.

Undergraduate Teaching Assistant, Classical Greek Language, Department of History, Colorado State University. Tutored students and evaluated student performance. Fall 1992. Advisor: J. Jordan.

GRANTS, SCHOLARSHIPS, AND HONORS

City of Grand Junction Excellence in Teachiug Award, Spring 2005.

Academic Enrichment Fund, Mesa State College, Fall 2004, Fall 2002, Fall 1999.

Bruce Dixon Scholar and Mentor Award, Mesa State College, Fall 2000.

OSC Grant, Office of State Colleges, Colorado, Fall 2000.

Biggs-Zollner Grant, Mesa State College Foundation, Spring 2000.

Graduate Student Travel Grant, Graduate School, Washington State University, Spring 1998.

Sigma-Xi Grant-In-Aid of Research, Sigma Xi, Spring 1998.

Guy Brislawn Graduate Student Award and Scholarship (for outstanding achievement in teaching and/or research), Department of Zoology, Washington State University, 1997.

Graduate Student Minigrant, College of Sciences, Washington State University, 1996 (matching awarded by the Department of Zoology at WSU)

Lerner-Gray Marine Fund Grant, American Museum of Natural History, 1996.

Edward Meyer Minigrant, College of Sciences, Washington State University, 1996 (P.I.: P.C. Schroeder).

Graduate Student Teaching Assistantship, Department of Zoology, Washington State University, August 1994-present.

University Honors Program Scholar, Colorado State University. August 1987-May 1993.

University Honors Program Scholarship, Colorado State University, Spring 1992.

Phi Beta Kappa Scholar, Colorado State University. August 1992-present.

Colorado Merit Work Study Recipient, Colorado State University, August 1988-May 1993.

Hewlett-Packard Scholarship, Colorado Springs Division, Colorado. Fall 1987.

PUBLICATIONS

Dyer, L., and A.D.N. Palmer. Eds. 2004. Piper: A model genus for studies of chemistry, ecology, and evolution. Kluwer/Plenum Academic Press. New York.

Herbst, M., Prescott, J., Palmer, A.D.N., and Schountz, T. 2002. Sequence and expression analysis of deer mouse interferon-gamma, interleukin-10, tumor necrosis factor, and lymphotoxin-alpha. Cytokine 17 (4): 203-213.

Palmer, A.D.N. 2000. Phylogenetic analysis and the evolution of reproductive strategies within the Syllidae (Annelida: Polychaeta). Bulletin of Marine Science 67(1): 671.

Palmer, A.D.N. 1999. Molecular Phylogenetics and Character Evolution of Polychaetous Annelids and their Allies. Washington State University. (dissertation)

Name:

Stephen Robert Stern

Start Year: 2011

Program:
Biological Sciences

Department:
Biological Sciences

COLORADO MESA UNIVERSITY

Full-time Faculty Vita

Faculty Rank

○ Professor ◉ Assistant Professor

○ Associate Professor ○ Instructor

Highest Degree

PhD	University of Utah	Biology	2011

Education: (List all degrees beginning with most recent-include post docs and external certificates)

Ph.D., Biology, University of Utah, 2011

B.S., Biology, University of North Carolina- Asheville, 2004

Teaching 2003-Present:

Courses Taught

BIOL 107, Principles of Plant Biology

BIOL 107L, Principles of Plant Biology Lab

BIOL 320, Plant Systematics

BIOL 387, Structured Research

Evidence of Continuous Improvement

International Botanical Congress, Melbourne, Australia, July 23-30, 2011

American Society of Plant Taxonomist Botany Meeting, Providence, Rhode Island, July 31- August 1, 2010

American Society of Plant Taxonomist Botany Meeting, Snowbird, Utah, July 25-29, 2009

Society for Systematic Biology Evolution Meeting, Moscow, Idaho, June 13-16 2009.

Society for Systematic Biology Evolution Meeting, Minneapolis, Minnesota, July 20-24, 2008.

6th International Solanaceae Conference, Madison, Wisconsin, July 23-27, 2006.

Supervision of Student Research/Project(s)

Fall, 2011: Preparation of a popular guide to the plants of Bang's Canyon, Colorado with undergraduate research student

Scholarship and Creative Work, 2003-Present:

Scholarship Related to Discipline

Journal Articles

S. Stern and L. Bohs. 2012. An explosive innovation: Phylogenetic relationships of *Solanum* section *Gonatotrichum* (Solanaceae) *Phytokeys* 8:83-98. doi:10.3897/phytokeys.8.2199.

S. Stern, M.F. Agra, and L. Bohs. 2011. Molecular delimitation of clades within New World species of the "spiny

solanums" (*Solanum* subg. *Leptostemonum*). *Taxon*. 60: 1429-1441.

S. Stern, T. Weese, and L. Bohs. 2010. A three-gene evolutionary study of *Solanum* section *Androceras*. *Systematic Botany*. 4: 885-893.

S. Stern and L. Bohs. 2010. Two new species of *Solanum* (Solanaceae) from the Amotape-Huancabamba Zone of southern Ecuador and northern Peru. *Phytokeys* 1:33-65 doi:10.3897/ phytokeys.1.660.

S. Stern and L. Bohs. 2009. Two new species of *Solanum* from Ecuador and new combinations in *Solanum* section *Pachyphylla* (Solanaceae). *Journal of the Botanical Research Institute of Texas* 3(2): 503-510.

S. Stern, E. Tepe and L. Bohs. 2008. Checklist of *Solanum* of north-central Peru, a hotspot of biological diversity. *Arnoldoa* 15:277-284.

L. Bohs, T. Weese, N. Myers, V. Lefgren, A. Van Wagenen, N. Thomas, and S. Stern. 2007. Zygomorphy and heterandry in *Solanum* in a phylogenetic context. *In* L. Bohs, J. Giovannoni, R. Olmstead, D. Shibata, and D. Spooner [eds.] Solanaceae VI: Genomics Meets Biodiversity. Acta. Hort. 745: 201-223.

S. Stern. 2005. Biogeographical Investigation Using Florulas for Seven Sites in Northern South America. *UNCA Journal of Undergraduate Research.*

Conference Presentations

"Prickly Phylogenies: An overview of the spiny solanums. International Botanical Congress 2011, July 23-30 2011 Melbourne, Australia.

"A thorny tangle in the genus *Solanum*: Phylogenetic study of *Solanum* subgenus *Leptostemonum,*" Botany 2010 (American Society of Plant Taxonomists), July 31- Aug. 1, 2010 Providence, Rhode Island.

"A spiny situation in the genus *Solanum*: Delimiting sections in subgenus *Leptostemonum,*" Botany 2009 (American Society of Plant Taxonomists), July 25-29, 2009 Snowbird, Utah.

"Systematics of *Solanum* section *Androceras,*" Evolution Meeting (Society for Systematic Biology), June 13-16, 2009 Moscow, Idaho.

"Systematics of *Solanum* section *Gonatotrichum*" Evolution Meeting (Society for Systematic Biology), July 20-24, 2008 Minneapolis, Minnesota.

"Trees for Troublesome Taxa: A molecular phylogeny of *Solanum* section *Geminata*" 6th International Solanaceae Conference, July 23-27, 2006 Madison, Wisconsin.

Other:

Grants

The Riser Award for Outstanding Research in the Department of Biology, University of Utah, May 2011: $705

A. Herbert Gold and Marion W. Gold Scholarship, University of Utah, August 2010: $2500

American Society of Plant Taxonomists Travel Grant, July 2009: $300

University of Utah and ASUU travel grant, May 2009: $1000

Seville Flowers Botany Award, University of Utah, May 2006: $250

Joan and Rachel Hunt Summer Scholarship in Field Botany from the Garden Club of America, May 2003 and 2004: $2000

Professional Memberships

American Society of Plant Taxonomists

Botanical Society of America

International Association of Plant Taxonomists

Society of Systematic Biologists

Association of Southeastern Biologists

Utah Native Plant Society

Service 2003-Present:
Department
2011

-- Faculty Search Committee

Local
2011

--Tour for the Colorado Native Plant Society

Advising 2003-Present:

Honors and Awards 2003-Present:
National
Garden Club of America Joan and Rachel Hunt Award, 2004

Garden Club of America Joan and Rachel Hunt Award, 2003

Local
University of Utah Riser Award, 2011

Professional Experience:

Please record the number "items/events" you have listed above in the following categories.
If you specify items/events under "other," please provide an explanation/definition.

	Books	**Book Reviews**		**Creative Publications**
8	**Journal Articles**	**Performances**		**Patents**
6	**Conference Presentations**	**Exhibitions**	4	**Grants-funded and non-funded**
	Sabbaticals	**Fullbright**		**Book Chapter**
	Other (related to discipline)			

Curriculum Vitae

Thomas R. Walla
Department of Biology
Mesa State College
Grand Junction, CO 81501
Tel: (970) 248-1146
email: twalla@measastate.edu

EDUCATION:

B.A. Economics, John Muir College, University of California, San Diego (1991).

Ph.D. Department of Biology, University of Oregon, Eugene OR (2000).

LANGUAGES: Fluent written and spoken Spanish.

EMPLOYMENT:

- 2005 – present Associate Professor, Mesa State College
- 2001 - 2005: Assistant Professor, Mesa State College
- 2000: Instructor, University of Oregon: Ecology
- 1995-2000: Laboratory Instructor, University of Oregon

TEACHING EXPERIENCE:

Course Instructor: Plant-Animal Interactions 406; Advanced Ecological Methods 405; Advanced Ecological Methods Lab 405L; Tropical Ecosystems 415; Entomology 331; Entomology Lab 331L; General Human Biology 101; General Human Biology Lab 101L; Ecology 370; Genetics and Ecology Lab 264L; Genetics and Evolution Lab 261; Forest Biology Lab 307L;
Children's Environmental Trust Rainforest Ecology Workshop (K-12).

Graduate Teaching Fellowships: Introduction to Cell Biology 211; Biodiversity 375; Pollination Biology 399; Conservation Biology 483/583; Summer Outreach in Science 1997,1998.

International Instruction: Tropical Field Biology 396. Designed and instructed a two-week summer field course in Ecuador 2002 for Mesa State College.

DOCTORAL DISSERTATION:

- Dissertation Title: "Neotropical Fruit-Feeding Nymphalid Butterflies: Temporal and Spatial Measures of Diversity and Community Dynamics"
- Trained in experimental design and detailed statistical analysis of biodiversity data including: sampling techniques, laboratory preparation and identification of butterfly and ant specimens, and analysis of data for publication.

RESEARCH EXPERIENCE:

- Directed an extensive seven year inventory study of fruit-feeding nymphalid butterflies in the canopy and understory of a tropical rainforest in Eastern Ecuador. Also hired, trained and supervised undergraduate students and indigenous workers in investigation techniques and data collection for this project.

- Managed a three year baseline of diversity information for the area around La Selva Lodge including: inventories of reptiles, birds, herpetofauna, overall butterfly diversity, and botanical collections.

PROFESSIONAL AFFILIATIONS:

President: Population Biology Foundation; **Chair:** Western Colorado Center for Tropical Research

Research Associate: Yana Yacu Biological Station, Ecuador; El Monte Biological Station, Ecuador; La Selva Lodge Biologial Station, Ecuador

AWARDS:

Co- Principle Investigator: National Science Foundation: Biological Surveys and Inventories: Caterpillars and Parasitoids of the Eastern Andes. (see www.caterpillars.org)

Biggs-Zollner Faculty Enrichment Grant (2002)
Academic Enrichment Fund (2002,2003, 2004) Professional Presentation Fund (2003)

PUBLICATIONS OF THOMAS WALLA

Greeney, HF, M Lysinger, TR Walla, & J Clark 1998. First description of the nest and egg of the Tanager Finch (*Orreothraupis arremenops*) with additional notes on behavior. Ornitologia Neotropical 9: 205-207.

DeVries, P.J., T. Walla & H. Greeney. 1999. Species diversity in spatial and temporal dimensions of fruit-feeding butterflies from two Ecuadorian rainforests. *Biol. J. Lin. Soc.*. 68: 333-353.

DeVries, P.J., C.M. Penz and T.R. Walla. 1999. The biology of *Batesia hypochlora* from an Ecuadorian rainforest (Lepidoptera, Nymphalidae). *Tropical Lepidoptera* 10: 43-46.

Lande, R., DeVries, P.J. & T.R. Walla. 2000. When species accumulation curves intersect: ranking diversity using small samples. *Oikos* 89:601-605.

DeVries, P.J. & T.R. Walla. 2001. Long-term spatial and temporal species diversity in a neotropical fruit-feeding nymphalid butterfly community. *Biol. J. Lin. Soc.* 74: p.1-15

Engen,S., Walla T.W., DeVries, P.J. 2002. Analyzing spatial structure of communities by the two-dimensional Poisson lognormal species abundance model. *American Naturalist.*

Walla, T.R., Engen S., DeVries, P.J., Lande, R. 2004. Modeling Vertical Beta Diversity in Tropical Butterfly Communities. Oikos

Curriculum Vitae

NAME: Steven D. Werman, Ph.D.

POSITION:

Professor, Department of Biological Sciences
Department of Biological Sciences
School of Natural Sciences and Mathematics
Mesa State College
1100 North Ave.
81501-3122
e-mail: swerman@mesastate.edu

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2037 Conestoga Dr.
Grand Junction CO 81503

TELEPHONE

Office: (970) 248-1909
Home: (970) 243-3751

EDUCATION

Research Fellow in Molecular Biology, California Institute of Technology 1986-89
Ph.D. 1986 Biology, University of Miami, Florida
M.S. 1980 Biology, California State University, Long Beach
B.S. 1977 Zoology, California State University, Long Beach

WORK EXPERIENCE

Department Head, Biological Sciences 2004-2005
Assistant Dean, School of Natural Sciences and Mathematics Dec 2003- Mar 2005
Professor and Chair, Department of Biological Sciences, MSC. 1997-2003
Associate Professor, Department of Biology Mesa State College, 1993-1997
Assistant Professor, Department of Biology, Mesa State College, 1989-1993
Lecturer in Molecular Biology, Department of Biology, California State University, Dominguez Hills, CA, 1989
Lecturer in Developmental Biology, Department of Biology, University of Miami, 1984-86
Lecturer in General Biology, Department of Biology, University of Miami, 1983

AREAS OF SPECIALIZATION

Herpetology, Molecular Genetics, Evolution, Systematics, Biogeography, Tropical Biology

RESEARCH AREAS/INTERESTS

My research has focused on the systematics, biogeography and evolution of Neotropical reptiles. I have used information of morphology, allozymes and DNA sequence information to generate hypotheses of relationship among pitvipers using cladistic methods. These relationships have been used to refine and understand the systematics, evolution and biogeography of these reptiles. I am also interested in the genetic analysis of gene flow and species differentiation in amphibians.

RECENT PUBLICATIONS

Werman, S.D. 2007 Rattlesnake phylogeny and the evolution of neurotoxic phospholipases in rattlesnake venoms. *In*: The biology of the rattlesnakes. Hayes, W., et al.. eds. Loma Linda University Press, Calif. (in press).

Werman, S. D. 2005. Hypotheses on the historical biogeography of bothropoid pitvipers and related genera of the Neotropics. Pp. 306-365 *In*: Ecology and evolution in the tropics: A herpetological perspective. Donnelly, M., et al.eds. University of Chicago Press, Chicago IL.

Werman, S. D. 2001. Book review: A field guide to the amphibians and reptiles of the Maya World. By Julian C. Lee. Copeia 2001 (2): 580-582.

Werman, S. D. 1999. Molecular phylogenetics and morphological evolution in Neotropical pitvipers: An evaluation of mitochondrial DNA sequence information and the comparative morphology of the cranium and palatomaxillary arch. Kaupia 8:113-126.

Werman, S. D. , Crother, B. I. and M. E. White. 1999. Phylogeny of Some Middle American pitvipers based on 12S and 16S mitochondrial DNA sequence information. Cont. Herp. 1999(3) 14pp.

Werman, S. D. 1997. Systematic implications of lactate dehydrogenase isozyme phenotypes in Neoropical pitvipers (Viperidae: Crotalinae). Pp. 79-88. *In.* Venomous Snakes: Ecology, evolution and snakebite. Thorpe, R. S.,Wuster, W. and A. Malhotra (eds.). Symp. zool. Soc. Lond. No.70, Oxford University Press. 276 pp.

Qaddour, J. S., Werman, S. D., and P. Misra. 1997. A singularly perturbed mathematical model of bacterial gene regulation (Lac Operon). Proc. of I.E.E.E. Singapore Int. Symp. on Control Theory and Appl. 1: 374-378.

Werman, S. D., Springer, M. S. and R. J. Britten. 1996. Nucleic Acids I: DNA-DNA Hybridization. Pp. 169-203 *In* Molecular Systematics. Second edition. Hillis, D. M., Moritz C. and B. K. Mable (eds.), Sinauer Assoc. Sunderland, MA, USA. 655 pp.

Werman, S. D. 1992. Phylogenetic relationships of Central and South American pitvipers of the genus *Bothrops* (*sensu lato*): Cladistic analyses of biochemical and anatomical characters. Pp. 21-40 *In.* Biology of the Pitvipers. Campbell, J. A. and E. D. Brodie, Jr. (eds.), Selva, Tyler, Texas. 467 pp.

COURSES TAUGHT

Anatomy and Physiology Lab, BIOL 209L
Developmental Biology, BIOL 310/310L
Evolution, BIOL 403
General Biology, BIOL 101
Attributes of Living Systems, BIOL 105
Herpetology, BIOL 413/413L
Molecular Genetics, BIOL 425
Pathophysiology, BIOL 241
Principles of Genetics, BIOL 301/301L
Biotechnology, BIOL 396
Senior Thesis, BIOL 483

COLLEGE SERVICE

Academic Policies Committee (Chair)
Library Committee (Chair)
Budget Advisory Task Force
President's Advisory Council
Sigma Xi Secretary
Student Appeals Committee
Biology Club Advisor
Faculty Senate
Higher Learning Commission Steering Committee
Animal Care and Use Committee
Selection committees (several)
Council of Chairs
PreMed Club Advisor

Resume

Dr. Bruce A. Bauerle
Biologist, Vertebrate Zoologist, Marine Ecologist
Professor of Biological Sciences
Mesa State College
1100 North Avenue
Grand Junction, CO 81501-3122
Office Phone: 1-970-248-1684
FAX: 1-970-248-1700
E-mail: bauerle@mesastate.edu

July 2006

Home: 2245 N. 15th St. #B
Grand Junction, CO 81501-4210
Home Phone: 970-243-7084
Cell: (seldom turned on) 970-216-2615
Emergency: (970-257-7894 daughter)

EDUCATION:

Post Doctoral class work in the areas of marine biology (California and Maine), Rocky Mountain flora, Oregon rainforests, ecology and conservation of marine birds and mammals, and mountaineering. Marine ecology experience on six scientific research vessels and naturalist / lecturing experience on over thirteen cruise lines. Extensive world travel to over thirty countries, including Amazonia, Tasmania, Antarctica, New Guinea, and the Galapagos Islands.

University of Northern Colorado. Doctorate of Arts in Zoology and Ecology, 1972. Dissertation research funded through the Natural Resource Ecology Lab of the International Biology Project, Colorado State University, by the National Science Foundation. Topic: Biological Productivity of Snakes of the Pawnee Site.

Graduate School at the University of Kansas, Lawrence, 1968-69.

Master of Arts in Biology and Education at the University of Missouri, Kansas City, 1967-68.

Bachelor of Science degree in Education in the Biology Concentration program at the University of Kansas, Lawrence, 1963-67.

EXPERIENCE:

Professor of Biological Science at Mesa State College from 1972 to the present. Courses taught include general biology, invertebrate zoology, anatomy, ecology, aquatic biology, ornithology, developmental biology, bioethics, honors field biology, and survival.

Associate Professor of Biology, University of Colorado, Boulder, on the M.V. Universe, Semester at Sea program, cruising completely around the world teaching ecology, 1980. Several days to a week were spent in each of the following countries: Japan, Taiwan, Hong Kong, China, Philippines, Indonesia, India, Egypt, Greece, and Spain.

Assisted in teaching a three week class in Ecuador (cloud forest and lowland rainforests) and Galapagos Islands (wildlife), 2006. Assistant Professor in a seven-week field biology class in Mexico, Belize, and Guatemala, taught by the University of Northern Colorado, Greeley, 1974.

CRUISE LINE / ECOTOUR GUIDE EXPERIENCE:

Marine Ecology / Naturalist Ecotour Leader and/or Lecturer aboard the following ships*:

1980. M.V. Universe. Professor on the Semester At Sea program. One around-the-world voyage of four months with 12 ports of call (Japan, China, Taiwan, Hong Kong, Philippines, Indonesia, Sri Lanka, India, Egypt, Greece, Spain).

1985. M.V. Rotterdam. Holland American Line, World Cruise. U.S., Hawaii, Philippines, Hong Kong.

1985-86. M.V. Viking Sky. Royal Viking Line, Christmas Cruise. Virgin Islands, Curacao, San Blas, Panama Canal, Mexico, Fort Lauderdale.

1986. M.V. Stardancer. Sundance Cruise Line. Alaska.

1986-87. M.V. Liberte. American Hawaii Line, Christmas Cruise and New Years Cruise. Two weeks in Tahiti, Bora Bora, Morea, and other islands in French Polynesia.

1987. M.V. Stella Solaris. Sun Line Cruises. Puerto Rico, St. Thomas, St. Martin, St. Barthelmey, St. Johns, Antigua.

1987-88. M.V. Bermuda Star. Bermuda Star Line, Christmas Cruise and New Years Cruise. Two weeks from U.S., Mexico, Costa Rica, Panama Canal, Columbia, Mexico, U.S.

1988. M.V. Stardancer. Sundance Cruise Line. Two one-week voyages, Alaska.

1989. M.V. Stardancer. Admiral Cruise Line. Two one-week voyages, Alaska.

1990. M.V. Sea Princess. Princess Cruise Line. Australia, New Zealand, Pago Pago, Bora Bora, Moorea, Tahiti.

1990. M.V. Viking Serenade. Royal Viking Line. Two one-week voyages, Alaska.

1991. M.V. Pacific Princess. Princess Cruise Line. Hawaii, Christmas Island, Bora Bora, Tahiti.

1991. M.V. Regent Star. Regency Cruise Line. Four one-week voyages, Alaska.

1991-92. M.V. World Renaissance. Eprotiki Cruise Line. Christmas/New Years two two-week cruises. Martinique, St. Lucia, Bequia, St. Vincent, Tobago, Devil's Island, Belem (Brazil), Amazon Narrows, Santarem, Alter do Chao, Boca do Valerio, and Manaus (all Brazil).

1992. M.V. Regent Star. Regency Cruise Line. Four one-week voyages, Alaska.

1992. M.V. Universe World Explorer Cruises. Two ten-day cruises, Alaska.

1993. M.V. Regent Star. Regency Cruise Line. Two one-week voyages, Alaska.

1993. M.V. Regent Star. Regency Cruise Line. Jamaica, Costa Rica, Columbia, Aruba.

1993-94. M.V. Columbus Caravelle. Transocean Cruise Line. One nineteen-day voyage, Antarctica. Chile, Falkland Islands, South Georgia Island, Antarctica, Cape Horn, Beagle Channel, Chile.

1994. M.V. American Adventure. American Adventure Cruise Line. Two one-week voyages. U.S., Bahamas, Dominican Republic, U.S.

1994. M.V. Regent Sea. Regency Cruise Line. Two one-week voyages, Alaska.

1995. M.V. Regent Sea. Regency Cruise Line. Mexico, Costa Rica, Panama Canal, Columbia, Jamaica.

1996. M.V. Royal Odyssey. Royal Cruise Line. One two-week voyage. Aruba, Costa Rica, Panama Canal, Mexico, U.S.

1998. M.V. Galapagos Adventure. One ten-day voyage as naturalist/guide in Galapagos Islands, Ecuador.

1999. M.V. Mistral. One seven-day voyage as naturalist/guide in Galapagos Islands, Ecuador.

2000. M.V. Galapagos Adventure II. "Millenium Voyage." One seven-day voyage as naturalist/guide in Galapagos Islands with an additional four days in Quito, Ecuador.

2000. M.V. Regal Princess. Two one-week voyages as naturalist in Alaska.

2002. M.V. Dawn Princess. Four one-week voyages as naturalist in Alaska.

2003-04. M.V. Splendor of the Seas, Royal Caribbean Cruise Line. Twelve-day Christmas/New Years voyage as naturalist to Mexico, Grand Cayman, Belize, Honduras, Panama Canal, Costa Rica.

2004. M.V. Dawn Princess. Four one-week voyages as naturalist in Alaska.

2005. M.V. Regal Princess. Three ten-day voyages as naturalist in Alaska.

2006. M.V. Diamond Princess. Four seven-day voyages as naturalist in Alaska.

*The above trips include professional travel only. **Extensive** personal travel has also taken place to more destinations than can conveniently be listed.

OTHER EXPERIENCE:

Survival lecturing for various agencies and industries, including: Mountain Bell Telephone, U.S. Bureau of Land Management, Western States Natural Gas, St. Mary's Air-Life Helicopter Staff, U.S. Bureau of Reclamation, Public Service Company of Colorado, Grand Junction Chamber of Commerce, etc.

Aspen Center for Environmental Studies; Aspen, Colorado. Guest Professor, "Mountain Winter Ecology," taught on cross country skis, spring 1986. Vail "Ecology Institute" for teachers, taught in the high mountain ecosystems, summer 2002.

Extensive public speaking experience at all levels of business, industry, and education in Western Colorado. Lecture/slide show presentations for large groups, clubs, organizations, and high school/junior high/grade school classes on topics such as rainforests, coral reefs, whales, seals, sharks, otters, marine fisheries, Galapagos Islands, Antarctica, Alaska, New Guinea, Australia, Amazonia, etc. A number of travel/adventure colloquia have been presented for the faculty and staff at Mesa State College. Numerous "Wednesday Night Wandering" outdoor-adventure community slide shows sponsored by the Mesa State College Outdoor Program.

Citation from the City of Grand Junction and the Grand Junction Police Department for heroic actions in saving the life of Mrs. G. Mooney (from drowning in an ice-filled irrigation canal, at great personal risk) in April, 1980. TV media exposure for saving a second victim from drowning in 1996.

Continuous experience in curriculum development; including interdisciplinary classes (San Juan Symposium), graduate student courses (How to Give Nature Hikes in the Elementary Schools), (A Snowshoe Nature Hike on Grand Mesa) and mountaineering classes (Survival), as some examples.

Experienced backpacker, sea kayaker, white water kayaker, rock climber, snowboarder, windsurfer, and cross country/telemark/downhill skier. Certified scuba diver. Experienced photographer, above and below water.

Environmental impact study experience at Fort St. Vrain nuclear power plant in Colorado, and Glenrock, Wyoming, coal-fired power plant concerning ecophysiological effects of environmental pollutants on vegetation.

Outstanding success at "community service" projects over the long term. Early advocate for the establishment of bicycle lanes, North Avenue beautification, new sign codes, a greenbelt/connected lakes urban trail system, and moose reintroduction—all of which were eventually completed in the Grand Junction area.

Kannah Creek Basin Assessment. Inventoried various human impacts and the occurrence of threatened and endangered species, for the U.S. Forest Service, Grand Mesa District, 1981.

Unsigned student evaluations concerning lecturing ability, interest level, grading, etc., normally average 4.5 or above on a 5.0 possible scale.

Faculty committees include being elected to the Faculty Senate, the Salary Committee, the Grievance Committee, chairmanship of the Promotion and Retention Committee, chairmanship of the Tenure and Promotion Committee, and the Lectures and Forums Committee.

Selected as "Outstanding Educator" for 1999 by the Grand Junction, Colorado area Chamber of Commerce.

Selected again in 2003 as "Outstanding Educator" by the Chamber of Commerce of Grand Junction. (Only one other person has been selected twice for this honor.)

Received the "Distinguished Faculty Award" for the year 2000 (Mesa State College's 75th Anniversary). This is the highest honor the college can bestow upon a member of its faculty and came with medallion, plaque, and a $2,000 stipend.

OF INTEREST:

In September of 1982, my rather unique survival class was featured in a half-page article in the Japanese version of *Sports Illustrated Magazine* and in a five-page article in another popular Japanese Magazine, *Heibon Panch.* In July of 1986, *Heibon Panch* featured my urban survival techniques in a ten-page magazine article. The very first issue of a new Japanese magazine, *Survival,* featured a seven-page article about my survival class and teaching techniques in April, 1986.

My article, "Athletes Too Often Learn Risk of Injury Only by Experience," was published in the *Rocky Mountain News* and numerous other Scripps-Howard newspapers across the United States on Sunday, Dec. 28, 1986. It was subsequently picked up by the Associated Press and published in the *National Collegiate Athletic Association News,* Jan. 14, 1987.

My publication, "Emergency Drinking Water Collected from Plants," was selected to be used as a script by the Developing Countries Farm Radio Network, and has been translated and read over the air in 207 dialects and languages worldwide.

I have had many exciting experiences living and camping on the coasts of Mexico, Canada, Europe, Australia, Tasmania, etc., etc., doing diving, sea kayaking, wind surfing, and other adventurous sports while studying local wildlife and botany.

PUBLICATIONS:

Bauerle, Bruce. 1991. "Emergency Drinking Water Collected from Plants: a Non-Destructive Technique for Survival in Arid Lands." *AT Source,* a quarterly magazine on technology and development. Vol. 19, No. 3. Netherlands. Originally published in both French and English.

Bauerle, Bruce. 1987. "Escape From the Classroom (How to Give Nature Hikes)." *Science and Children*; Journal of the National Science Teachers Association of the NEA. Oct., Vol. 25, No. 2.

Bauerle, Bruce. 1986. "Disaster in the Laboratory: the Poison Gas Crisis." *Journal of Chemical Education.* Vol. 63, p. A188. American Chemical Society.

Trlica, M. J., R.D. Child and B.A. Bauerle. 1985. "Leaf Injury and Elemental Concentrations in Vegetation Near a Coal-Fired Power Generating Station." *Journal of Water, Air and Soil Pollution.* April, Vol. 24, No. 4, pp. 375-396.

Bauerle, Bruce. 1983. *Shiti Sabaibaru (Urban Survival).* Japanese edition by Yamate Shobo Publishers. This book sold more than 6,000 copies in the first four months.

Bauerle, Bruce. 1982. *Urban Survival.* Sentinel Printing Company, Colorado. 188 p.

Fitzgerald, J.P., B. Bauerle, et al. 1982. *Small Mammals, Furbearers, and Small Game Animals of Northwestern Colorado—a Review and Synopsis of Information.* BLM. U.S. Depart. of the Interior. 290 p.

Bauerle, Bruce, David L. Spencer and William Wheeler. 1975. "The Use of Snakes as a Pollution Indicator Species." *Copeia.* 2:366-368.

Trilica, M.J., B.A. Bauerle, L.F. Brown and R.D. Child. 1974. *Ecophysiological Characteristics of Vegetation Surrounding the Fort St. Vrain Nuclear Generating Power Plant.* Thorne Ecological Institute, Boulder, Colorado. 54 p. (Rights to this publication are restricted by Public Service Company of Colorado.)

Bauerle, Bruce. 1972. "Biological Productivity of Snakes of the Pawnee Site." *U.S. IBP Grasslands Biome Tech.* Rep. No. 207. Colo. State Univ., Fort Collins. 71 p.

Bauerle, Bruce and D.L. Spencer. 1971. "Environmental Pollutants in Two Species of Snakes from the Pawnee Site." *U.S. International Biology Project Grasslands Biome Tech. Rep.* No. 137. Colo. State Univ., Fort Collins. 15 p.

LOCAL (COMMUNITY) PUBLICATIONS:

Bauerle, Bruce and Duane Hrncir. 2005. *A Snowshoe Hike on Grand Mesa, Including Landmarks Along the Road and Comments on Plants and Wildlife.* Free download at www.mesastate.edu/schools/snsm/biology/index.htm.

SCIENTIFIC PAPERS PRESENTED:

Bauerle, Bruce. 1989. "Collection of Drinking Water for Human Consumption from Live Arid and Saline Vegetation: a Non-Destructive Technique." *Journal of the Colorado-Wyoming Academy of Science.* Vol. XXI, No. 1.

RESEARCH INTERESTS:

I have a special interest in development of interesting "biological" ecotourisim presentations (slides/lectures/displays) that may be utilized in courses taught at Mesa State College and in local schools/communities, as well as for use on cruise ships. I enjoy developing and teaching unique survival skills for the layman relating to biological, chemical, and nuclear disasters and terrorist attacks.

SABBATICAL LEAVE:

Sabbatical leave was granted from Mesa State College for the spring and summer semesters of 1990. Unique organisms and ecosystems in Fiji, Australia, New Zealand, Pago Pago, and Tasmania were investigated and photographed (including marine systems such as the Great Barrier Reef). These five months were spent backpacking, usually alone, into some pretty interesting places.

CURRICULUM VITAE

Gary Loren McCallister
Professor of Biology
Mesa State College
1100 North Avenue
Grand Junction, Colorado 81501
Office Phone: 970/248-1939
Home Phone: 970/245-3989
E-Mail: mccallis@mesastate.edu
gmccallister@bresnan.net

BIRTH DATE:

February 26, 1945 - Grand Junction, Colorado USA

MARITAL STATUS:

Married, four married children, 16 grandchildren

MAJOR AREAS:

Zoology/Parasitology/Science Education

EDUCATION:

Mesa College	1963-65	English Literature
Brigham Young University	1968-70	Zoology, B.S. minor, English Literature
	1970-72	Parasitology, M.S.
Univ. Of Northern Colorado	1976-82	Biology, Doctor of Arts – emphasis in Parasitology

CONTINUING EDUCATION:

NSF Short Course. University of Utah	1979	Immunology
International Center for Public Health Research. University of South Carolina	1988	Control of mosquitoes and mosquito-borne diseases
Curry College, Massachusetts	1990	National Laboratory Safety Conference
Clemson University, South Carolina	1991	Nematode Identification Course
American Mosquito Control Assoc., Ft. Mead, FL	1993	Emergency Mosquito Control and Mapping for Aerial Spray

NSF Short Course. Christian Brothers Univ., Memphis, Tenn.	1994	Evolutionary Systems in Artificial Life
Logo Symposium. St. Paul, Minn.	1995	Logo Symposium - Artificial Life
Florida Mosquito Control Assoc. Florida St. Univ., Tallahassee, Fl.	1996	Mosquito Systematics
NSF Short Course. Tallahassee, Florida	1997	Who Needs Mganetic Fields National High Magnetic Field Lab
Stonington Retreat. Stonington, Maine	1997	Logo Symposium - Robotics
Colorado Logo Symposium Mesa State College, Colorado	1997 - 2001	Logo Symposium - Robotics
Mindfest, MIT, Boston	1999	Constructionism and Robotics in education
Jazz Guitar - 8 years	1992 - 2000	Gary Smith Productions Grand Junction, CO
Classical Mandolin - 3 years	2000-2003	Walt Birkedahl studio Grand Junction, CO
Beekeeping Workshop	2008	CSU Extension Agency Grand Junction, CO
Native Bee Workshop	2009	CSU Extension Agency Grand Junction, CO
Presently studying Dulcimer	2010	Kentucky Music Week,

MAJOR CONFERENCES:

Metropolitan State College	1989	First Annual Multicultural Education Conference
Eisenhower High Plains Colorado State University	1993	Math and Science Integrative Conference: Consortium for Math and Science
Colorado State University	1997	NSF Conference on Integrating the Biological Sciences
Colorado State University	1998	NSF Conference on Core Curriculum Reform

PROFESSIONAL EXPERIENCE:

Staff, Logo Foundation, 1999-Present (www.logo-foundation/about/staff-gm)
Chairman, Biology Department, 1983-1984, 1986-1990, 1994-1998
Professor of Biology, 1987-Present
Associate Professor of Biology, 1978-1987
Mesa State College, Grand Junction, Colorado
*Project Coordinator, Redlands, 1980-1997
Mosquito Control District, Grand Junction, Colorado. Summers, 1981-1997
*Technical Writer, 1981-1982
Paraho Oil shale Company, Grand Junction, Colorado
*Medical Technologist, 1980-1981
Grand Junction Community Hospital, Grand Junction, Colorado
*Teaching Assistant, Biology, 1976-1978
University of Northern Colorado, Greeley, Colorado
Assistant Professor of Biology, 1975-1978
Mesa College, Grand Junction, Colorado
Instructor of Biology, 1972-1975
Mesa College, Grand Junction, Colorado
*Seminary Instructor, 1974-1976
LDS Church, Grand Junction, Colorado
Research Assistant, 1971-1972, NIH Grant to Dr. F. L. Andersen
Brigham Young University, Provo, Utah - Echinococcus Project
Teaching Assistant, 1969-1971, Brigham Young University, Provo, Utah

Concurrent Part-time Positions

RESEARCH EXPERIENCE: (Not resulting in publications)

Experimental

1. The effect of irrigation on pasture survival of nematodes (under direction of Dr. Ferron Andersen, BYU).
2. The effect of dichlorvos on free-living stages of parasitic nematodes (under direction of Dr. Ferron Andersen, BYU).
3. Effect of temperature on growth of three species of Bacillus (contract research for Dr. Warren Buss, UNC).
4. Field trials of control methods involving biological control of mosquitoes. Field testing of attractants for adult female mosquitoes.
6. Hybridization in Culex sp. in west central Colorado.

Surveys

1. Parasitic nematodes of west central Colorado (report to local Wool Growers Association).
2. Parasitic nematodes of west central Colorado (report to local Cattlemen's Association).
3. Hydatid disease in southern Utah (under the direction of Dr. Ferron Andersen, BYU).
4. Hydatid disease in west central Colorado (contract research for Dr. Ferron Andersen, BYU).
5. Ectoparasites of fish at the junction of the Colorado and Gunnison rivers.
6. Baseline information on mosquito populations in west central Colorado.

7. Varroa invasion of western Colorado bees.
8. Encephalitis surveys in west central Colorado (in cooperation with CDC).
9. Mosquitoes of Mesa County, continued from1982 until present.

INSTITUTIONAL SERVICE

1974 – 75, 1978. Member Faculty Salary Committee. Helped establish ranking and merit pay. Chairman, Faculty Salary Committee in 1975.

1978-1985. Chairman (first) Faculty Awards Committee. Established award,

1983. Liaison Officer to the Office of Federal Programs (AASCU) Grant training workshop in Washington, D.C.

1984-1987, 1992-93. Elected to Faculty Senate. Additional temporary appointment fall 2005

1986-1989. Chairman, Faculty Development Committee, Established committee and established an in-house grant program to help faculty with scholarly outside projects.

1989-1990. Instructor, Partners in Progress Precollegiate Program for Minorities, Mesa State College.

1993-1996. College Representative for BSCS-COSTEP in conjunction with School District 51.

1991-1994. Organizer and Director, Mesa State College Science Team. Developed science fair projects with selected middle school students, summers.

1994- 1997 Chairman, Science Building Executive Committee for designing and overseeing construction of new science building.

1997 – 2003 Director and Originator of the Annual Colorado Logo Symposium.

2001 – 2004 Member: Center for Teaching and Learning.

2006 Conducted study on how the Biology Department can best serve public school science teachers in School District 51.

RESEARCH PUBLICATIONS:

1. McCallister, G. L. 1976. Effect of Haloxon and Thiabendazole on the Free-Living Stages of Haemonchus contortus. Helm. Soc. of Wash. 43:89-80.

2. McCallister, G. L. 1977. Efficiency of the Seinhorst Filter for the Recovery of Eimeria tenella Oocysts, from Feces. Helm. Soc. of Wash. 44:218-219.

3. McCallister, Gary L. 1977. Intestinal Nematode Parasites of Cattle in

West Central Colorado. J. of Parasitology, 93(3):527.

4. McCallister, G. L. And G. D. Schmidt. 1978. Diurnal Migration of Female Thelastoma bulhoesi in the cockroach Periplaneta americana. 53rd Annual Meeting of Amer. Soc. of Parasitologists: Abstract 69.

5. McCallister, G. L. 1980. Teaching Teachers to Teach. J. Of College Science Teaching. 9:211-214.

6. Sears, B. W., J. C. Herideman and G. L. McCallister. 1980. Dirofilaria immitis in West Central Colorado. J. of Parasitology, 66:1070.

7. McCallister, G.L. 1980. Soft Drinks as a source of Carbon Dioxide: Use in the Excystation of Coccidian Oocysts. J. of College Science Teaching 9:276-277.

8. McCallister, G. L. And G. D. Schmidt. 1981. Diurnal Migration of Female Thelastoma bulhoesi in the cockroach Periplaneta americana. Helm Soc. of Wash. 48(2):127-129.

9. McCallister, G. L. 1981. The Biology of Thelastoma bulhoesi, a nematode parasite of cockroaches. Dissertation, University of Northern Colorado, Greeley.

10. McCallister, G. L. and G. D. Schmidt. 1983. Development of Thelastoma bulhoesi (Oxyurata: Thelastomatida) and the Effect of Thiabendazole on the Unembryonated Egg. J. of Nematology, Vol. 15, No. 2.

11. McCallister, G. L. And G. Eastham. 1984. The Turbatrix t test. Carolina Tips. 47(7).

12. Maleki, Mitra and G. L., McCallister. 1984. Incidence of the leech Helobdella stagnalis on the Colorado River in west central Colorado. Great Basin Naturalist. 44(2):361-362.

13. McCallister, G. L. And G. D. Schmidt. 1984. The effect of temperature on the development of Thelastoma bulhoesi (Oxyurata,Thelastomatida) and other nematodes. J. of Nematology. 16(4):355-360.

14. Orr, Thomas and G. L. McCallister. 1987. American swallow bug, Oeciacus vicarius Horvath (Hemiptera: Cimicidae), in Hirundo rustica and Petrochelidon pyrrhonota nests in west-central Colorado. Great Basin Naturalist 47(2).

15. McCallister, G. L. 1988. The Effect of Thelastoma bulhoesi and Hammerschmidtiella diesing: on host size and physiology in Periplaneta americana. Helm. Soc. Wash. 55(1):12-14.

16. Diers. J. And G.L. McCallister. 1989. Incidence of Cryptosporidium in day-care children in west central Colorado. J. of Parasitology. 75(4):637-638.

17. McCallister, G. L. 1989. The Roles of the Laboratory in Teaching College Level Science. J. of the Colo. Wyo. Acad. of Sci. 21:19.

18. McCallister, G. L. 1992. The use of degree days to predict Culex populations in the field. J. of the Amer. Mosq. Control Assoc. 8(1):63-66.

19. McCallister, G. L. 1993. The effect of temperature, pH, sodium chloride, and glucose on the survival of female Thelastoma bulhoesi (Nematoda: Oxyurata). Helm. Soc. of Wash. 60(2): 170-173.

20. McCallister, Z. G. and G. L. McCallister. 1996. Quantitative Phagocytosis. The American Biology Teacher 58(6):348-351.

21. Peterson, Rick; Tara McCallister, Bill Tiernan and Gary McCallister, 1998. Collecting Micrometeorites in Collaboration with Middle School Students. Proceeding of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science 38 (1):50.

22. McCallister, Gary L. 1998. Life as Information Processing: a biologists point of view. Proceedings of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science 38(1):51.

23. McCallister, Gary L. 1998. The Origins of Disease. Proceedings of the Rocky Mountain Conference of Parasitologists 29: 4-7.

24. McCallister, Gary L. 1998. The Response of Adult Female Mosquitoes (*Aedes* and *Culex*) to Several Types of Floral Attractants Over the Course of the Breeding Season in West-Central Colorado. Proceedings of the Rocky Mountain Conference of Parasitologists 29:7-8.

25. McCallister, Zane G. and Gary McCallister. 1998. Can *Culex* Numbers Serve as an early Warning for Encephalitis Outbreaks? Proceedings of the Rocky Mountain Conference of Parasitologists 29:8-9.

26. McCallister, G.L. 1999. A computer model of host seeking behaviors. Proceedings of the 52nd Annual Meeting of the Utah Mosquito Abatement Association.

27. McCallister, G.L., Gary Mullens and Zane McCallister. 1999. Acarine parasites of mosquitoes in west-central Colorado. Proceedings of the 52nd Annual Meeting of the Utah Mosquito Abatement Association.

28. McCallister, G.L. and Brett DeGooyer. 1999. The effect of a photodynamic dye,

Rose Bengal, and light on first stage larvae of *Culex tarsalis*. Proceedings of the 52nd Annual Meeting of the Utah Mosquito Abatement Association.

29. Heckmann, Richard, and Gary McCallister. 2001. The Fine Structure and Attachment of Acarine Parasites on Mosquitos in West Central Colorado. Proceedings of the Annual Conference of the Utah Academy of Sciences, Arts & Letters.

30. McCallister, G. L. 2002. Guest Editorial: A Proposal to Improve Science Education in the Public Schools. The American Biology Teacher 64:247-248.

31. McCallister, G. L. 2004. Emerging Problems in Parasitology in North America. Proceedings of the Annual Conference of the Utah Academy of Sciences, Arts & Letters.

32. McCallister, G. L. 2005. DNA as Binary Code. Journal of College Science Teaching 34(5):34-37.

33. Zrelak, Yoshi and Gary McCallister. 2009. Investigating Membranes. The Science Teacher. 76(6):41-45.

34. Richard Heckmann, Zane McCallister, and Gary McCallister. 2011. Electron Microscopic study of mites of mosquitoes from western Colorado. Western North American Naturalist. Pending fall 2011

PUBLICATIONS:

1. McCallister, G. L. 1974. Play Gypsy Play. Clover Collection of Verse.

2. McCallister, G. L. 1975. Wasted. Clover Collection of Verse.

3. McCallister, G. L. 1980. Root Dip Boosts Yields. In Reader's Forum Organic Gardening, April, p. 22.

4. McCallister, G. L. 1981. Thirty-Five. In the World's Great Contemporary Poems.

5. McCallister, G. L. 1982. To Thelastoma bulhoesi: Upon Completion of my Doctoral Dissertation. In Para-Poems. C. Arme and S. Richards, eds. University of Keele, Staffordshire, England.

6. McCallister, G. L. 1982. Notes on the Woods Cross Exit. In the Mesa College Literary Review, 1981-82. P. 14-15.

7. McCallister, G. L. 1983. Book review of The Invertebrate World by R. H. Barth and R. E. Broshears. In J. Of College Sci. Teaching 13(5):452.

8. McCallister, G. L. 1984. A Technical Analysis: doing Battle with Culex tarsalis. Outlook Magazine. Fall.

9. McCallister, G. L. How to diagnose your own livestock for intestinal parasites. Mother Earth News, Fall 1984.

10. McCallister, G. L. What's the Difference? Outlook Magazine. Winter 1985.

11. McCallister, G. L. 1985. Song of Rescue (short story), Ensign, July.

12. McCallister, G. L. 1985. Book Review of Science and Religion in the Nineteenth Century by Tess Cosslett, ed. In J. of College Science Teaching 15(2): 425-144.

13. McCallister, G. L. 1985. A review of the Features section of the Journal of College Science Teaching, 1984-1985 in Report on the Journal of College Science Teaching, 1985. Edited by Jack L. Carter, JCST Advisory Board.

14. McCallister, G. L. 1986. Would you like to see a nematode? Challenge 4(4) Iss. 19: 35-36.

15. McCallister, G. L. 1986. Editorial: The role of the laboratory in teaching parasitology. ASP Newsletter 8(1): 7-8.

16. McCallister, G. L. 1988. Book review of "The Light Microscope: Principles and practice for Biologists" by Ernst Fallenbach. Journal of College Science Teaching 17:303.

17. McCallister, G. L. 1988. The Shot (poetry) Goal Post Scripts 7(1):9.

18. McCallister, G. L. 1988. Rx for Mental Block - Take a Walk. Walkways 4(1):3.

19. McCallister, G. L. 1989. Our Thanksgiving Cow (short story). The Friend (Nov.) 19:2-5.

20. Van Orden, LaVonne, ed. 1989. Blessed by the Hymns. Chapter 14: Song of Rescue, Deseret Books, Salt Lake City, Utah.

21. McCallister, G. L. 1991. I Hate That (short story) in The New Era.

22. McCallister, G. L. 1992. Three poems: An Afternoon, Dan at 16, Daniel"s Monolith. Zarahemla 1(4):5-6.

23. McCallister, G. L. 1994. Taking exception to Jeremy Bernstein. Letter to the editor in J. of College Science Teaching. 23:199.

24. McCallister, G. L. 1996. Logo As Science. ...lcs.www.media.mit.edu/groups/logofoundation/profdev/happycamper.html.

25. McCallister, G.L. 1999. The Kindergarten Model of Education Logo Update. Vol. 7 Fall.

26. McCallister, G.L. 1999. In the Beginning. Mandolin Quarterly. 4(4) Dec.

27. McCallister, G.L. 2001. The Duo Capriccioso: up close and personal. The Mandolin Journal. XV(3):10-11.

28. McCallister, G.L. 2002. Mandointrospection: The Flaming Moth Studio. The Mandolin Quarterly 16(1): 17-18.

29. McCallister, G.L. 2002. The Flaming Moth Studio: Lesson 1 & 2. The Mandolin Quarterly. 16(2): 19 and 29.

30. McCallister, G.L. 2002. The Flaming Moth Studio: Lesson 4&5. The Mandolin Quarterly. 16(4): 3 and 10.

31. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 6&7. The Mandolin Quarterly. 17(1): 11.

32. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 8&9. The Mandolin Quarterly. 17(2): 8

33. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 10&11. The Mandolin Quarterly. 17(3): 10,11

34. McCallister, G.L. 2003. The Flaming Moth Studio: Lesson 12&13. The Mandolin Quarterly. 17(4): 10,11

35. McCallister, G.L. 2004. The Flaming Moth Studio: Lesson 14&15. The Mandolin Quarterly. 18(1): 10

36. McCallister, G.L. 2004. The Flaming Moth Studio: Lesson 16&17. The Mandolin Quarterly. 18(2): 11

37. McCallister, G.L. 2004. The Flaming Moth Studio: Lesson 18&19. The Mandolin Quarterly. 18(3): 10,11

38. McCallister, G.L. 2005. The Flaming Moth Studio: Lesson 20&21. The Mandolin Quarterly. 19(1): 10,11

39. McCallister, G.L. 2005. The Flaming Moth Studio: Lesson 22&23. The Mandolin Quarterly. 19(2): 10,11

40. McCallister, G.L. 2005. The Flaming Moth Studio: Lesson 24&25. The Mandolin Quarterly. 17(3): 10,11

41. McCallister, G. L. 2008 –present. Weekly column in The Daily Sentinel. Grand Junction, Colorado. 200+ columns as of Jan. 2014.

SOFTWARE AND DIGITAL PRODUCTIONS DEVELOPED:

Mosquito Host Seeking Behavior Model, 1998

Fundamentals of Teaching, released January 2004

Communicator Award 2004 - International Award for Digital communication media, Education Division

Flaming Moth Productions est. 2003

8 Music CDs produced and released since 2003.

GRANT PROPOSALS FUNDED:

1. Colorado Consortium of State Colleges. Plan and host the Rocky Mountain Conference of Parasitologist. 1983. ($1,000.00)

2. Colorado Consortium of State College. Travel funds to attend national meetings of the American Society of Parasitology. 1984. ($500.00)

3. Colorado Consortium of State Colleges. Travel funds to attend national meeting of the American Society of Parasitologist and the American Association of Tropical Medicine and Hygiene. 1985. ($500.00)

4. Colorado Consortium of State Colleges (with Phyllis Chowdry). Feasibility of acquisition of human cadavers. 1986-87. ($700.00)

5. Colorado Consortium of State College (with Rick Ballard). Feasibility study and planning for greenhouse construction. 1987-88. ($500.00)

6. Colorado Consortium of State Colleges (with Ed Hurlbut). Identification of, and visit to, three colleges with excellent reputations to study programs and compare them to Mesa State College. $500.00)

7. Mesa County, Colorado. Develop and implement a mosquito control program for Mesa County in response to a 1985 St. Louis Encephalitis outbreak. This was a cooperative effort, with Mesa State College providing personnel, laboratory space, and equipment and Mesa County providing funds and Vehicles. 1986. ($35,000.00) 1987 ($25,000.00) 1988 ($25,000.00)

8. Redlands Mosquito Control District. Attend a one week course on Control of Mosquitoes and Mosquito Borne Diseases sponsored by the International Center for Public Health Research (Univ. Of S. Caroline). 1988. ($1200.00)

9. Mesa State College Faculty Development. Attend national meetings of the American Mosquito Control Association to participate on national committees. 1992.

1993 ($2000.00)

10. Mesa State College Faculty Development. Attend the NSF course on Evolutionary Systems, Christian Brothers Univ., Memphis, Tennessee . 1994. ($1500.00)

11. Mesa State College Alumni. Dixson Mentor/Scholar Award. 1994-95. Nematode parasites of Iguana ($2000.00)

12. El Pomar Foundation. Purchase of Robotics Kit for course development. 1996. ($700.00)

13. Mesa State College Technology Grant. Purchase robotic equipment and software. Travel funds to visit MIT. 1996. ($1500.00)

14. Mesa State College Alumni. Dixson Mentor/Scholar Award. Distribution of Aedes ova during winter months. 1997-98. ($2000.00)

15. MSC Professional Development. Provide classroom technology training for local teachers. 1998. ($12,000.00)

16. MSC Professional Development. With Warren MacEvoy and Jim Rybak. Provide technology and robotic training for local teachers. 1999. ($20,000.00)

COURSES TAUGHT (and # of times taught):

Organismal	Medically Related	Miscellaneous
Parasitology (29) Invertebrate Zoology (17) General Zoology (15) Microbiology (27) Entomology (5)	Anatomy and Physiology (30) Immunology (10) Cell Biology (3) Histology (3) Epidemiology (15)	General Biology - non majors (5) General Biology - majors (10) Methods of Teaching Science - Graduate Level (2) Undergraduate (19) Technobiology (3)

PROFESSIONAL SOCIETIES, ACTIVITIES, AND HONORS:

Honors

Music CD Nominated for Pearl Awards in 5 categories (2006)
Male Recording Artist, New Recording Artist, Contemporary Album, Cover Design, and Songwriter. - Awards ceremony to be held in June

Invited Speaker - BYU Education Week 2004 (substitute), 2005 (substitute), 2006 – 2009 (full appointment)

Communicator Award (2004)

Appointed Board of Directors, Revolutionary Sciences, Inc. (2003- to present)

Elected member Sigma Xi (1978)

Dixson Mentor/Scholar (1996, 1998)

Received Boettcher Fellowship (1977-78)
President-Rocky Mountain Conference of Parasitologists (RMCP) (1982-83)
(1995-96)
Secretary/Treasurer RMCP (2000-2003)
Distinguished Faculty Award (1988)

Activities

Founder, CEO, Flaming Moth Productions (2003)
Program Chairman - RMCP (1983, 1998)
Member Center for Teaching and Learning (1998 - 2004)
Founder, CEO Bee bar Bee Ranch (B-B) (2010)

Societies

Member - American Society of Parasitologists - 1970 - present
Rocky Mountain Conference of Parasitologists 1970 - present
National Science Teachers Association 1982 – present
(Editorial Review Board, 1992-1995)
Helminthological Society of Washington 1970 - present
American Biology Teachers 1975 - 2005
American Mosquito Control Association 1982- 2003
Member - Training Committee, 1991-1994
Publication Committee, 1991-1994
Editorial Board, 2001
Entomology Society of America, 1996 - 2005
The Society of Nematologists, 1971 - 2005
International Society for Technology in Educatiaon, 1991- 2005
Colorado State Beekeepers Association, 2009
Western Colorado Beekeepes Association, 2011

COMMUNITY SERVICE:

Founded Western Colorado Beekeepers Association, 2011
Redlands Mosquito Control District Governing Board, 2001 to 2004
Grand Valley Mosquito Control Task Force (1998-2003)
Member School Board, Colorado School District 51. 1993-1995
School District Accountability Committee. 1992-93.
Advisory Board. Tri-River Extension Agency. 1980-1983.
Scoutmaster. Boy Scouts of America. 1986-1990.
Church of Jesus Christ of Latter Day Saints - presently serving as Bishop 2003 - 2009
Soccer Coach 10-year old league, 1985 to 1989.

BUSINESS EXPERIENCE:

Bee bar Bee Ranch (B_B) 2010 - present
Flaming Moth Production Company 2003 - present
Board of Directors Revolutionary Science 2000 - present
Consultant in Mosquito Control - 1982 - present
Beekeeper 1982 – 86, 2009 - present
Real Estate Sales 1974 - 78
Fuller Brush sales 1973 - 1974

REFERENCES:

Mr. Michael Temple: President, Logo Foundation
250 W. 85th Street
New York, NY 10024
michaelt@media.mit.edu

Robert E. Kribel: retired Dean, MSC
674 Ogletree Road
Auburn, AL 36830
Home (334) 821-9075
Cell (334) 329-0512
bkribel@charter.net

Dr. Christian Buys: Professor of Psychology
Mesa State College
Grand Junction, Colorado 81501
(970) 248-1764
cbuys@mesastate.edu

Dr. Denise McKenney: Chairman, Biology Department
Mesa State College
1100 North Ave.
Grand Junction, CO 81502
(970)248-1909
dmckenne@mesastate.edu

Dr. Richard Heckmann: Professor of Zoology (retired)
Brigham Young University
Provo, Utah 84601
(801)225-7482
richard_heckmann@byu.edu

Dr. Ferron Andersen: Professor of Zoology (retired)
Zoology Department
Brigham Young University
Provo, Utah 84601
(801) 225-7482

Name:

Jonathan T Cooley

Start Year: 2003

Program:
Physical Sciences

Department:
Physical and Environmental Sciences

COLORADO MESA UNIVERSITY

Lecturer Vita

Highest Degree

MS	Institution Montana State University	Discipline Earth Sciences	Year 1993

Education: (List all degrees beginning with most recent-include post docs and external certificates)

Bachelor of Science in Geology, University of Colorado, Boulder, 1984

Teaching 2003-Present:

Courses Taught

Geology 105-Geology of Colorado; Geology 106-Introduction to Dinosaurs; Geology 333-Geology of Canyonlands; Biology 101-General Biology; Biology101 lab; Geology 111 lab

Evidence of Continuous Improvement

Innovative Materials/Activities

Designed and led field trips pertinent to Colorado Plateau geology and paleontology
Developed a hands-on, fossil cast, interactive course segment

Prior Professional Experience Relevant to Current Position: (Include year(s) of employment, employer, position title and responsibilities)

Year(s) of Employment	Employer	Position Title	Position Responsibilities
15	Lindblad Expeditions	Lecturer, Zodiac driver	Guide and lecture concerning natural history of ship based destinations including: Arctic, Antarctic, Antilles, Central America, and Indonesia
8	Dinamation International Society	Director of Expeditions	Design, staff, and lead paleontological expeditions to fossil localities including: Mongolia, Argentina, Mexico, Alaska, and Southwest U.S.
12	Educational Expeditions	Company Owner/Founder	Design, staff, and lead geological and paleontological expeditions to sites in Southwest U.S.

Please record the number "items/events" you have listed above in the following categories.
If you specify items/events under "other," please provide an explanation/definition.

	Books	1	Book Reviews	Creative Publications
1	Journal Articles		Performances	Patents
2	Conference Presentations		Exhibitions	Grants-funded and non-funded
	Sabbaticals		Fulbrights	Book Chapters
	Other (related to discipline)			

Curriculum Vitae

2002

NAME

Richard Craig Dujay

ADDRESS

3656 North 15th Street
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TELEPHONE

970-263-931 Home
970-248-1690 MSC office
970-640-4671 Cell

ELECTRONIC MAIL

dujay@wpogate.mesastate.edu

DATE OF BIRTH

March 15 1957

EDUCATION

Ph. D. Zoology concentrations in Ecology, Cell Biology and Population Genetics. Colorado State University, 1998.
Masters of Science, Zoology, concentrations in Electron Microscopy and Genetics. Colorado State University, 1994.
Bachelor of Science, Biological Science. Colorado State University, 1993.
Associates of Arts. North Harris College, 1991. (w/Honors).
Associates of General Studies. North Harris College, 1991. (w/Honors).
Peace Officer. Houston Community College, TX, 1983. (Dean's List).
Paramedic, University of Texas School of Allied Health Sciences, 1980.
Firefighter. Houston Community College, TX, 1975.

HONORS AND AWARDS

Who's Who Historical Society 2001 - 2002
Marquis Who's Who 2000-2001.
Lexington's Who's Who Life Time Award.
Best Graduate Student Presentation. Annual meeting of the SWARM Division of AAAS, Mesa State College, Grand Junction , Colorado. 1998.
Graduate Student Fellowship, Colorado State University, 1994.
Honors Graduate, North Harris College, 1991.
Dean's List, North Harris College, 1991.
Dean's List Houston Community College, 1983.

Curriculum Vitae

ASSOCIATIONS

Gamma Sigma Delta, The Honor Society for Agriculture.
Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science.
Colorado/Wyoming Academy of Science.
Zoological Society of the Rockies.
Colorado State University Chapter of the National Wildlife Society.
National Wild Turkey Federation.
National Audubon Society.
Masonic Lodge.

OFFICES HELD

President and Treasurer for the Colorado/Wyoming Academy of Science.
Scientific Coordinator for the Western Investigations Team (WIT) in conjunction with the Museum of the West Grand Junction, Colorado
Chair of the Electron Microscope Committee, Mesa State College.
Manager of Animal Care Facility, Mesa State College.
Director of the Center for Microscopy, Mesa State College.
Forensics Minor Committee Member
National Audubon Society. Grand Valley Chapter. Member, Board of Directors, Chair of Interns.

PROFESSIONAL EXPERIENCE

Lecturer of Biology, and Director of the Center for Microscopy, Manager of the Animal Care Facility Mesa State College, August 1998 – present.
Wildlife Biologist and Consultant, ***Wild Diversity***™ Grand Junction, Colorado, 2000 - present..
Teaching Assistant, Field Biology, Colorado State University, 1998.
Wildlife Research Assistant, Colorado Division of Wildlife Avian Research Center, Fort Collins, Colorado, 1994 - 1998.
Teaching Assistant Developmental Biology, Colorado State University, 1996.
Teaching Assistant Cellular Biology, Colorado State University, 1994 – 1996.
Teaching Assistant, Humans and Other Species, Colorado State University 1992 – 93.
Firefighter/Paramedic, Houston Fire Department/Hazardous Materials Response Team, 1983 – 91.
Commissioned Peace Officer, State of Texas, 1983 - 1987.
Paramedic, Houston Fire Department, 1980 – 1983.
Firefighter, Houston Fire Department, 1975 – 1980.

Curriculum Vitae

ABSTRACTS AND PUBLICATIONS

Dujay, Richard C. 1993. EFFECTS OF AGE AND GENOTYPE ON ALCOHOL REACTIVITY IN MICE. Colorado/ Wyoming Academy of Science, Denver, Colorado.

Dujay, Richard C. 1993. GENETIC BASIS FOR COAT COLOR IN DOGS AND SELECTIVE BREEDING. Graduate Student Symposia, Colorado State University Fort Collins, Colorado.

Dujay, Richard C., D.M. Gilliam, R.S. Ackley, and Donald J. Nash. 1994. THE EFFECTS OF PRENATALLY ADMINISTERED COCAINE ON AUDITION IN MICE. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Durango, Colorado. Master's Thesis.

Dujay, Richard C., Ali Alyaseri, and Donald J Nash. 1994. EFFECTS OF AGE AND SEXUAL EXPERIENCE ON SEXUAL BEHAVIOR IN MICE WITH THE QUINKY MUTATION. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Durango, Colorado.

Nash, Donald J., Richard C. Dujay. 1994. THE EFFECTS OF THE MICROPHTHALMIC WHITE GENE ON AUDITION IN MICE. Jackson Laboratories, Bar Harbor, Maine.

Dujay, Richard C. 1995. TAEKWONDO; HANDBOOK FOR STUDENTS AND INSTRUCTORS. STC Publishing Comp. Fort Collins, Colorado.

Dujay, Richard C. 1995. MANAGEMENT OF LARGE MAMMAL POPULATIONS ON PRIVATE RANCH LANDS. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Oklahoma City, Oklahoma.

Dujay, Richard C. 1995. GENETIC DIVERSITY AMONG POPULATIONS OF MERRIAM'S WILD TURKEYS IN COLORADO. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Oklahoma City, Oklahoma.

Dujay, Richard C. D. J . Nash, Moses Schandfiel. 1996. DNA EXTRACTION FROM WHOLE AVIAN BLOOD. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Flagstaff, Arizona.

Dujay, Richard C., D. J. Nash, Richard Hoffman. 1996. GENETIC DIVERSITY OF COLORADO'S MERRIAM'S WILD TURKEY. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Flagstaff, Arizona.

Dujay, Richard C., Fernando Torres, D. J. Nash. 1996. THE AUTOSOMAL HAIRLOSS MUTATION IN MICE. Jackson Laboratories, Bar Harbor, Maine.

Curriculum Vitae

Dujay, Richard C., D. J. Nash. 1997. NON-ISOTOPIC RFLP'S OF COLORADO'S MERRIAM'S WILD TURKEYS. . Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Texas A & M University College Station, Texas.

Dujay, Richard C., D. J. Nash. 1997. THE EFFECTS OF STRINGENCY CONDITIONS ON THE M13 PROBE IN RELATION TO NON-ISOTOPIC RFLP'S OF WILD TURKEYS. Texas A & M University College Station, Texas.

Dujay, Richard C. 1997. MANAGEMENT OF COLORADO'S MERRIAM'S WILD TURKEYS IN A FRAGMENTED ENVIRONMENT. Texas A & M University College Station, Texas.

Dujay, Richard C. 1998. GENNETIC RELATIONSHIPS BETWEEN AND AMONG FRAGMENTED POPULATIONS OF COLORADO'S MERRIAM'S WILD TURKEYS. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Mesa State College, Grand Junction , Colorado.

Dujay, Richard C. 1998. THE M13 PROBE COMPARED TO SYNTHETIC OLIGONUCLEOTIDE PROBES VARYING HYBRIDIZATION CONDITIONS. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Mesa State College, Grand Junction , Colorado.

Dujay, Richard C. 1998. UPLAND GAME BIRD MANAGEMENT ON COLORADO'S WESTERN SLOPE. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Mesa State College, Grand Junction , Colorado.

Dujay, Richard C. 1998. NON-ISOTOPIC RFLPs OF COLORADO'S MERRIAM'S WILD TURKEYS. Ph.D. Dissertation

Kosanke, K. L., Richard C. Dujay. 2000. PARTICLE MORPHOLOGY - METAL FUELS. Journal of Pyrotechnics, No. 11.

Murphy, Willow, Walter A. Kelly and, Richard C. Dujay. 2000. NUTLET MORPHOLOGY AND THE USE OF SEMs TO DETERMINE CHARACTERISTICS FOR IDENTIFICATION OF SPECIECIES IN THE GENUS *CRYPTANTHA* LEHM. Ex g. DON SECTION *OREOCARYA* (E. GREENE) PAYSON. Microscopy Today, 00-6.

Kosanke, K.L., B.L. Kosanke, and Richard C. Dujay. 2000. PARTICLE MORPHOLOGY—LOW MELTING POINT OXIDIZERS. Journal of Pyrotechnics, No. 12.

Dujay, Richard C. 2001. ALFERD PACKER, THE SAN JUAN CANNIBAL. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science Annual Meeting. University of Northern Texas, Denton, Texas.

Curriculum Vitae

Dujay, Richard C. 2001. ALFERD PACKER; THE SEARCH FOR 127 YEAR OLD EVIDENCE. Colorado - Wyoming Academy of Science Annual Meeting. University of Colorado at Colorado Springs, Colorado Springs, Colorado.

Kosanke, K.L., B.L. Kosanke, and Richard C. Dujay. 2001. PYROTECHNIC REACTION RESIDUE PARTICLE IDENTIFICATION BY SEM/EDS. Journal of Pyrotechnics, No. 13.

Dujay, Richard C., K.L. Kosanke, 2001. MANUFACTURING AND PROCESSING TECHNIQUES AFFECTING MORPHOLOGY OF PYROTECHNIC OXIDIZER PARTICLES. Microscopy Today, 10-4.

Kosanke, K.L. and Richard Dujay. 2001. FORENSIC IDENTIFICATION OF PYROTECHNIC REACTION RESIDUE PARTICLES. Microscopy Today, 10-07.

Dujay, Richard C. et al. 2001. EDS INVESTIGATION INTO THE LEGEND OF CANNIBAL ALFERD PACKER OF COLORADO. Microscopy Today. 10-09.

Kosanke, K. L., B. J. Kosanke, and Richard C. Dujay. 2002. IDENTIFICATION OF PYROTECHNIC REACTION RESIDUE PARTICLES BY SEM/EDS. Journal of Forensic Science.

Fandrich, Joseph, and Richard C. Dujay. 2002. SECONDARY MELT CHARACTERISTICS: EVIDENCE SUPPORTING AN EXTRATERRSTRIAL PROVENACE FOR WESTWATER, UTAH, MICROSPHERULES. 54th Annual Meeting of the Geological Society of America for the Rocky Mountains. Denver, Colorado.

Fandrich, Joseph, and Richard C. Dujay. 2002. AN EXTRATERRESTRIAL ORIGIN FOR WESTWATER, UTAH MICROSPHERULES DETERMINED BY IDENTIFICATION OF SECONDARY MELT CHARACTERISTICS. Annual meeting of the USGS. Colorado Springs, Colorado.

Dujay, Richard C. 2002. INTRODUCTION TO SCANNING ELECTRON MICROSCOPY. ISBN 1-58692-471-0. Erudition Books, North Chelmsford, MA.

Fandrich, J.W. and Richard C. Dujay. 2003. SECONDARY MELT ORNAMENTATION ON WESTWATER, UTAH MICROSPHERULES: EVIDENCE OF AN EXTRATERESTRIAL PROVENACE. Microscopy Today, 11-01.

Dujay, Richard C. 2003. LABORATORY GUIDE AND FIELD KEY TO THE SKULLS OF NORTH AMERICAN LAND MAMMALS. ISBN 1-593990005-7. XanEdu Books, Ann Arbor, MI.

Dujay, Richard C. 2004. MICROSCOPIC INVESTIGATION OF THE AUTOSOMAL HAIRLOSS (HL) MUTATION IN MICE. Annual meeting of SWARM-AAAS. Denver, Colorado.

Curriculum Vitae

Fandrich, J.W., Richard C. Dujay. 2004. MICROSHPERULES IN THE BLACK DRAGON BRECCIS, BLACK DRAGON MBR. OF THE MOENKOPI FM,, SAN RAFAEL SWELL, UTAH: EVIDENCE SUPPORTING A BOLIDE IMPACT EVENT HORIZON NEAR THE PERMIAN/TRIASSIC BOUNDARY. Annual meeting of SWARM-AAAS. Denver, Colorado.

Fandrich, J.W., Richard C. Dujay. 2004. MEGATSUNAMITE/SEISMITE CHERT BRECCIA DEPOSITS IN THE BLACK DRAGON/HOSKINNINI MEMBER OF THE MOENKOPI FORMATION OF SOUTHEASTERN UTAH: EVIDENCE SUPPORTING A BOLIDE INPACT ON WET TARGET EVENT AT END PERMIAN/LOWER TRIASSIC. Annual meeting of the Colorado/Wyoming Academy of Science. Greeley, Colorado.

STEPHANIE JO MATLOCK
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ACADEMIC BACKGROUND

❖ Montana State University: Bozeman, Montana
M.S. in Biological Sciences - Awarded December 1993.

Thesis: "Interaction Between Deermice, Cattle, and Antelope Bitterbrush in Southwestern Montana"

❖ University of Colorado: Boulder, Colorado
B.A. Biology and B.A. Anthropology- Awarded August 1988.

PROFESSIONAL EXPERIENCE

Colorado Mesa University: Grand Junction, Colorado Aug 1995 – Present
Instructor of Biology

- Develop, prepare, and instruct courses in the Biology Department including:
  - Lower division courses in:
    - Introductory Biology lectures and laboratories for Biology majors (105 and 105L)
    - General Biology lectures and laboratories for non-majors (101, 102, 101L, and 102L).
    - Introductory Human Anatomy and Physiology lecture and labs for nursing and health majors (209 and 209L).
    - Freshman Year Initiative course for incoming freshman (SUPP 101).
  - Upper Division courses in:
    - Wildlife Management Lecture (418)
    - Wildlife Field Techniques (418L)
    - Ichthyology Lecture (336)
    - Desert Ecology (408)
    - Human Osteology (410)(410L)
  - Topics Courses including:
    - Primate Biology (396)
    - Survey of Forensic Anthropology and Osteology (396).
    - Small Mammal Biology (396)
    - Immigration Studies (Flav 496)-Interdisciplinary course involving 13 different professors from 7 departments discussing human immigration and border issues.

- Online Courses developed and instructed for Federal Firefighters and general students across the United States including:
  - General Ecology (211)
  - Wildlife Biology (418)
  - Desert Ecology (408)
  - Pathophysiology (241)
  - Anatomy and Physiology (209)

❖ Supervise several student interns who work with many agencies most semesters including:
- Colorado Division of Wildlife, Colorado Bird Observatory, and USDA Aphis Animal Damage.

❖ Supervise several Independent Study students who have worked on the following projects:
- Mammalian taxidermy specimen cleaning and cataloging.
- Duck wing identification, and organization of a collection containing 50 duck wings.
- Scientific illustration practice involving several mammalian skulls.
- Cleaning and cataloging of human skeletal material from the University's collections.

❖ Advise freshmen students preparing schedules, potential high school seniors, and undergraduates preparing for careers in natural resource management.

❖ Present public talks on a variety of topics including: African mammals, bird ecology and travel in Ecuador, and deermice/human interactions.

❖ Spent 2 months in Ecuador doing research on Beryl Spangled Tanagers and assisted 3 undergraduates with their research on bird communities in very primitive and isolated conditions in the cloud forest region of Ecuador.

Grand Travel: Galapagos Islands July 2007 and 2008.

Lecturer/Guide

- Accompanied 1—20 grandparents and grandchildren on ecological and educational tours of the Galapagos Islands, Ecuador.
- Responsible for the supplemental education of the grandchildren. Educational activities planned daily when the group was onboard the ship.
- Prepared extensive report about the trips.

EDx, L.L.C. (Educational Expeditions): Fruita, Colorado June 2000-Present

Lecturer/Guide

❖ Summer Field Expedition Tour programs specializing in Dinosaur excavation and ecology, and desert ecology:

- ❖ Handled tour groups from National Geographic, American Museum of Natural History, Smithsonian, and other alumni groups throughout a summer session for week long tours of 10-30 parents and children.
  - Taught local desert ecology, skeletal anatomy, and animal ecology to children ages 6-16.
  - Raft Guide for raft carrying 10 passengers on the Colorado River.
  - Problem solving for changes to itineraries, illnesses, injuries and other daily challenges.

U.S. Forest Service: Norwood and Delta Colorado. June- Sept. 94

Biological Technician

- ❖ Monitored 200 artificial nest boxes for use by boreal owls and other small owls such as northern saw-whet and flammulated owls.
- ❖ Surveyed 15 canyons on the Uncompahgre Plateau in southwestern Colorado for the endangered Mexican Spotted Owl. *Certified to survey for Mexican Spotted Owl.*
  - Hiked extensively at 5000-9000 foot elevations.
  - Used topographic maps, compass, and PBS maps daily.
  - Utilized 4-Wheel Drive vehicles on very rough and isolated roads.
  - Worked and lived intensively with one other person.
  - Hours of work consisted of dusk to dawn shift, hiking at night in rough terrain with only headlamps.
  - Encountered black bears and mountain lions at close range.
  - Able to identify most western owls by vocalization.
- ❖ Assisted in MAPS project for mark/recapture study of neotropical migrants.
  - Trapped birds in mist nests, extricated birds, identified, banded, sexed, aged, noted plumage condition, and reproductive condition for all birds.
  - Recorded data during highly successful trapping periods for multiple people.

Intermountain Desert Consultants: Durango, Colorado. Dec. 1993-Mar. 1994

Personal Business Biological Consultant

- ❖ Designed research project to determine bald and golden eagle habitat on 1,000 acre ranch.
  - Surveyed ranch for raptors.
  - Monitored critical areas used by bald eagles.
  - Prepared report of results and recommendations.
  - Interacted extensively with client, several federal agency personnel, and the public. Attended several public meetings.

Montana Department of Fish, Wildlife and Parks: Bozeman, Montana.
Sept. 1990-Feb. 1991

Block Manager/Check Station Attendant

- ❖ Responsible for a block management area encompassing both private and state-owned land during the fall hunting season. Interacted with both landowners and the hunting public. Patrolled block management area independently in a 4-wheel drive vehicle in all types of weather. Posted signs, distributed hunting regulations and information, and recorded hunting activity.
- ❖ Responsible for hunting check station during the regular and late hunting seasons. Extracted teeth for aging purposes and collected fetuses from harvested elk and deer. Weighed all harvested animals and recorded hunting information. Interacted with the public extensively.
- ❖ Assisted in a male mule deer mortality research project. Handled mule deer captured in drive nets, and assisted in tagging and radio-collaring animals.

The Peregrine Fund: Mackay, Idaho. July – Sept. 1990

Hack Site Attendant

- ❖ Cared for and maintained 6 immature Peregrine Falcons.
  - Observed falcons for 8 weeks until successful fledging occurred.
  - Observed and recorded falcon's daily behavior from sunrise to sunset.
  - Lived at 9500 ft in primitive fire look-out tower with a partner.

Okeanos Ocean Research Foundation: Hampton Bays, New York. Oct. 1989 – Feb. 1990

Research Volunteer

- ❖ Conducted distributional data analysis of the finback whales residing off the coast of Long Island, New York. Accompanied Director to Reykjavik, Iceland for International Whaling Commission Meetings.
- ❖ Handled sick and injured harbor and ringed seals.
- ❖ Assisted in removing oil from Murres and Gannets by washing birds in bucket system using Dawn dish washing detergent.

Lincoln Park Zoo: Chicago, Illinois. Apr. 1989 - June 1989

Animal Keeper Class II

- ❖ Cared for and maintained animals in the Children's Zoo.
  - Handled owls, hawks, iguanas, snakes, foxes, deer, African pygmy goats, and other small mammals. Cleaned cages for Rhinos, Elephants and Monkeys.
  - Presented interpretive talks to inner-city children about zoo animals and their behavior. Assisted in Poster presentations design for monthly events.

University of Colorado-Biology Dept.: Boulder, Colorado. June – Aug. 1988

Research Assistant

- ❖ Collected data for the analysis of behavioral interactions among related and non-related domestic honeybees.
  - Participated in kin recognition experiments to determine the ability of the honeybees to recognize kin through olfaction.
  - Designed own experiment and instrumentation, to determine the honeybee's ability to recognize specific organic compounds in their hives.

Colorado Division of Wildlife: Sept. 1986 – Jan. 1987 and July 1987

Research Volunteer/Intern

- ❖ Co-authored a document describing the essential habitat of threatened and endangered wildlife of Colorado.
- ❖ Assisted with a mountain goat survey research project on Mt. Evans, Colorado, surveyed at 13,000 feet with spotting scopes.

OTHER WORK EXPERIENCE

Western Colorado Regional Science Fair-Grand Junction, Colorado: Mar 2005-Present.

Co-Director

- ❖ Arranged logistics for the Western Colorado Regional Science Fair for 220 students, grades 6-12.
  - Recruited, organized and supervised 110 judges for exhibits.
  - Organized special awards from the community for students.
  - Prepared forms, communicated with multiple agencies, and orchestrated a hectic, high profile event.

Lindblad Expeditions-Volunteer for Lower and Upper Caribbean, Panama: Jan 1990-2000

- Helped prepare lectures about fruits and spices from St. Lucia.
- Helped with Birding Expeditions in Trinidad and Tobago.

Institute of Alpine and Arctic Research: July 1988

Volunteer Field Assistant for Long Term Ecological Study (LTES)

- ❖ Assisted in live trapping of rodents (marmots, voles, and deermice) and pikas using Sherman and Hav-a-Hart traps.
  - Recorded data and tagged captured animals.

Nickens and Associates: Montrose, Colorado. June 1985-September 1988

Archaeologist

- ❖ Worked seasonally with a private archaeological firm
- ❖ Duties involved:

  Mapping sites, survey of field areas for archeological evidence, stabilization of archeological sites, laboratory work specializing in animal skeletal material analysis. Responsible for writing reports following the fieldwork.

RESEARCH INTERESTS AND AWARDS

Research Interests:

- Small mammal ecology. Specifically Deermice (*Peromyscus maniculatus*) ecological components and interactions with humans.
- Animal Osteological remains from archaeological sites.
- Human Osteology and Forensic Science.

Awards:

- Excellence in Teaching-Every year from 2007-Present
- Summer Faculty Fellowship Program-Faculty Fellow for the USFWS. Summer 2013

TECHNICAL SKILLS AND CERTIFICATIONS

- ❖ Experienced with the use of radio telemetry equipment and techniques including:
  - Construction of transmitters
  - Utilization of receivers and hand held antennae.
- Experienced with use of Sherman Live traps, Hav-A-Hart traps, mist nets, and large game drive nets.
- Certified for Mexican Spotted Owl Inventory.
- Certified in Community CPR and Standard First Aid.
- Computer Skills:
  - ❖ Competent with the use of IBM compatible systems including word, excel, PowerPoint.
- Spanish – able to read and write proficiently, and understand and speak passably.
- Studied Italian at the college level.

ACTIVITIES

- Enjoy photography, art and natural history museums, technical rock climbing, hiking, bow hunting and rafting.
- Participated in the Rotary Club High School Exchange Program to Mexico.
- Traveled extensively throughout western Europe, the United Kingdom, Iceland, Guatemala, Africa, Ecuador, Galapagos Islands, Panama, and the Caribbean.

REPORTS AND PUBLICATIONS

Book Review: Fundamentals of Forensic Anthropology, by Linda L. Klepinger. Spring 2008. Reviewed by **Stephanie Matlock-Cooley** and Kimberly Spurr . The Applied Anthropologist. 28: (1)135-136.

Douglass, Richard, Amy Kuenzi, and **Stephanie Matlock-Cooley**. 2006. Deer mouse movements in peridomestic and sylvan settings in relation to Sin Nombre virus antibody prevalence. Journal of Wildlife Diseases. 42: (4).

Matlock-Cooley, S. J. and E. Holland. 1994. 1994 Mexican spotted owl inventory Uncompahgre National Forest, Colorado. Unpublished field report on file at the Supervisor's Office of the Uncompahgre National Forest, Delta, Colorado.

Matlock-Cooley, S. J. 1993. Interaction between deermice, cattle and antelope bitterbrush. Unpublished Master's thesis on file at Montana State University, Bozeman, Montana, 84 pp.

Matlock-Cooley, S. J. and L. Ness. 1991. Field Report published in the Peregrine Fund 1991 Annual Report.

Matlock, S. J. 1987. Faunal remains from Holly Group, Hovenweep National Monument. Appendix D: in The Maintenance and Structural Stabilization of Holly Group (5MT602), Hackberry Group (5MT601), Hovenweep National Monument, Southeastern Utah-Southwestern Colorado. Nickens and Associate Ruins Stabilization Report. National Park Service Technical Series No. 19.

Metzgar, T. R. and **S. J. Matlock**. 1987. Summary for Previous Stabilization Records, Hovenweep National Monument, Southeastern Utah-southwestern Colorado, Square Tower Group, Holly Group, Horseshoe Group, and Hackberry Group 1940-1983. Nickens and Associates Ruins Stabilization Report. National Park Service Technical Series No. 37.

Metzgar, T. R. and **S. J. Matlock**. 1987. Stabilization Assessment of Square Tower Group: Sites in Hovenweep National Monument, Southeastern Utah-southwestern Colorado. Nickens and Associates Ruins Stabilization Report. National Park Service Technical Series No. 36.

Matlock, S. 1986. Faunal Analysis of EU38, Yellow Jacket, Colorado. Ms. on file, University of Colorado Museum, Boulder, Colorado.

A. Zeynep Özsoy-Bean

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Education

Post-doctoral Fellow, Section of Microbiology, 2002-2005
University of California-Davis

Ph.D., Curriculum in Genetics and Molecular Biology, 2002
University of North Carolina at Chapel Hill

Bachelor of Science, Chemical Engineering, 1995
Boğaziçi University, Istanbul, Turkey

Research Experience

2002 – 2005
University of California-Davis
Laboratory of Dr. Stephen Kowalczykowski

Established the baculovirus system in the laboratory for recombinant protein overexpression. Purified human Replication Protein-A, Werner Syndrome Helicase, WRN and Bloom Syndrome Helicase, BLM using ACTA Prime and FPLC systems.

1997-2002
University of North Carolina at Chapel Hill
Laboratory of Dr. Steven W. Matson

Purified several helicases from *Escherichia coli* and insect cells. Performed enzyme assays for biochemical characterization of purified proteins. Constructed deletion strains of *E.coli* for genetic studies of helicases.

Teaching Experience

Part-time Instructor at Mesa State College (since 2006)

I have developed and taught the following two courses and will be teaching them again in 2010:

BIOL396 Topics: Protein Techniques (2009 1st Summer session)
Course description: In this course students learn about protein structure and function, translation and protein trafficking, overexpression and purification methods. In addition they will perform hands-on experiments that involve proteins. Some of the techniques that will be covered are: determination of protein molecular weight (when protein sequence is known and unknown), SDS-PAGE, Tricine Gels, Western Blots, protein overexpression, protein purification and measurement of enzyme activity (ATPase assay).

BIOL496 Topics: Molecular Cloning (2009 January term)
Course description: In this intense, hands-on course students learn how to clone a gene into a vector. Some of the techniques they use for their cloning are: PCR, agarose gel electrophoresis, restriction enzyme digests, extraction of DNA from agarose gels, quantification of DNA, ligation reactions, transformations and plasmid mini-preps.

In addition I have taught the following courses and will be teaching 301 and 301L in the Spring of 2010:

BIOL301 Principles of Genetics (2 semesters) Spring 2006, Fall 2007
Course description: Presents the basic principles of genetics including the biochemical nature of genes, principles of inheritance, gene expression, Mendelian genetics, population genetics, as well as aspects of recombinant DNA technology and gene regulation.

BIOL301L Principles of Genetics Laboratory (3 semesters) Spring 2006, Fall 2007, Spring 2009
Course description: The course consists of techniques and experimental procedures in the field of basic genetics, including experiments in Mendelian inheritance using fruit flies. Molecular genetics techniques of DNA isolation, restriction enzyme digests and gel electrophoresis will also be included

BIOL101L (2 Semesters) Spring 2007, Spring 2009
Course description: In this laboratory course for non-majors the following areas are covered: Ecology, pollution, drugs, reproduction, cancer, heart disease, disease problems, selected body structure and function relationships, phylum relationships, plant growth and development. The students spend half of the semester in the laboratory and the other half outside in field trips, experiencing biology first hand.

BIOL 105 Attributes of Living Systems (1 Semester) Spring 2008
Course description: In this introductory biology course for biology majors the following subjects are covered: Cell structure and function, cell energetics, biochemistry, genetics, ecology and evolution

BIOL105L Attributes of Living Systems Laboratory (1 Semester) Spring 2008
Course description: The introductory biology laboratory for the majors covers scientific method, cells, photosynthesis, enzyme kinetics, agarose gel electrophoresis and osmosis.

Teaching Assistantship at University of North Carolina at Chapel Hill

Biol 50: Molecular Biology and Genetics (2 semesters), 1997-1998
Course description: Structure and function of nucleic acids, principles of inheritance, gene expression, and genetic engineering. Three lecture hours and one recitation-demonstration-conference hour a week.

I was responsible for several recitation sections a week and evaluation of exams.

Biol 108: Microbiology (1 semester), 1999

Course description: Bacterial form, growth, physiology, genetics, and diversity. Bacterial interactions including symbiosis and pathogenesis (animal and plant). Use of bacteria in biotechnology. Brief introduction to fungi and viruses.

I was responsible for the laboratory portion of the class. Gave introductory lectures for labs, prepared the set up for laboratory exercises. Designed and graded exam questions for the lecture portion of the class and the final exam for the laboratory. Oversaw problem sessions.

Tutoring

Tutored several students in Molecular Biology and Genetics and in Microbiology, 1998-2000.

Professional Memberships

American Association for the Advancement of Science (since 2002)

University Service

Planned and participated in the recruitment programs of the Biology Department, Curriculum in Genetics and Molecular Biology and Interdisciplinary Program in Biomedical Sciences (IBMS), 1997-2001

Genetics curriculum representative in the Biology Graduate Student Association, 1998-1999

Co-Organizer, 1^{5t} Underwater Sciences and Technologies Meeting, Boğaziçi University, Istanbul, Turkey, 1996

Volunteer Work

Instructor's assistant at Explorit, a hands-on science museum, Davis, California, 2003-2004.

Programs and Workshops

Graduate and Professional Student Leadership Development Program
Attended and received certificate in the leadership training workshops for graduate and professional students 1999-2000.

Presentations and Publications

Nimonkar, A.V. **Özsoy A.Z.**, Genschel J., Modrich, P and S.C. Kowalczykowski (2008) Human exonuclease 1 and BLM helicase interact to resect DNA and initiate DNA repair, Proc Natl Acad Sci USA. 105(44): 16906-11.

Özsoy, A.Z., Ragonese, H. and S.W. Matson (2003) Analysis of Helicase activity and Substrate Specificity of Drosophila RECQ5 Helicase, *Nucleic Acids Res.* 31:1554-1564.

Özsoy, A.Z., Sekelsky, J.J. and S.W. Matson (2001) Biochemical Characterization of the Small Isoform of *Drosophila* RECQS Helicase, *Nucleic Acids Res.* 29:2986-2993.

Hall, M.C., **Özsoy, A.Z**. and S.W. Matson (1998) Site-directed Mutations in Motif VI of *Escherichia* coli DNA Helicase 11 Result in Multiple Biochemical Defects: Evidence for the Involvement of Motif VI in the Coupling of ATPase and DNA Binding, *J. Mol.Biol.* 277:257-271.

Poster Presentation at FASEB Summer Research Conference on Helicases: Structure, Function and Roles in Human Disease, July 7-12, 2001.

Poster Presentation at Keystone Meeting on DNA Helicases, Cancer and Aging, March 12-17,2002.

Speaker at Keystone Meeting on DNA Helicases, Cancer and Aging, March 12-17, 2002.

References

Available upon request

Shay Y. Fabbro, PhD
496 Ridge Lane
Grand Junction, CO 81504
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Academic Background

- Graduated May 2009 PhD in Human Medical Genetics, University of Colorado Denver Anschutz Medical Campus
- Graduated May 2003 B.S. in Biology, Mesa State College

Teaching Experience

- January 2011 to present. Adjunct faculty at Mesa State College; Biology for non-majors, Pharmacology, Biotechnology
- January 2010 to December 2010. Adjunct Faculty at Community College of Aurora; Biology for majors and non-majors

Professional Experience

- June 2009 to December 2010. Post-doctoral work at UCD/AMC, Aurora, CO
  Project involved with trying to find candidate genes responsible for the rare bleeding disorder, gray platelet syndrome utilizing the following techniques: handling of human whole blood, serum, and plasma, DNA extraction from aforementioned fluids, whole-genome amplification, genotyping using Affymetrix SNP chips, primer design for gene sequencing, use of Sequencher to analyze gene sequences.

- August 2003 to May 2009. Graduate work at UCD/AMC, Aurora, CO
  Thesis project involved examination of the plasminogen activator system in Alzheimer's disease. Worked with human brain tissue utilizing the following techniques: western blot, immunohistochemistry, immunofluorescence, immunocapture assays, ELISA, and zymography. Worked with mouse models including various knock-outs and transgenic animals utilizing the following techniques: Animal husbandry, PCR, western blot, immunohistochemistry, immunofluorescence, *in situ* hybridization, immunocapture assays, behavioral analysis, and surgical injections. Computer skills include: Microsoft Word, Powerpoint, Excel, EndNote, Corel Draw, Prism GraphPad, and AlphaImager v5.5

- August 2001 to May 2003. Undergraduate research at Mesa State College, Grand Junction, CO
  Under the supervision of Dr. Steven Werman, I worked on a project that focused on differentiating Cope's Giant (*Dicamptodon copei*) and Pacific Giant (*Dicamptodon tenebrosus*) salamanders using paired interspersed nuclear elements (PINES) to search for genetic markers that can be used to differentiate the two species.

- May 2001 to September 2001. Redlands Mosquito Control District, Grand Junction, CO
  Scouted areas of water in the Redlands area of Grand Junction for mosquito larvae and treated those areas with bacterial larvacide. Assisted the Mesa County Health

Department with bleeding of chickens.

- May 2001 to August 2001. Hanta Virus Research Aide: near Molina, CO.
  Set traps for deer mice on Grand Mesa and assisted with the collection of the mice for field studies to determine if mice were carrying Hanta Virus. Assisted with the collection of insects for parallel study to determine if the insect population affected the deer mice population.

- July 2000 to August 2000. Mesa State College
  In joint project with Oregon State University, Newport, OR, studied marine invertebrate communities and learned how to classify several species from the four different intertidal zones

Affiliations and Awards

Affiliations:

- Member of The Society for Neuroscience
- Member of the Tri-Beta National Honor Society, Epsilon Omicron Chapter

Awards:

- ASBMB Travel Award
- Frank G. Brooks Award for Excellence in Student Research, 2003

Publications

Papers:

- Kahr, Walter et al. 2011. Mutations in NBEAL2, encoding a BEACH protein, cause gray platelet syndrome. Accepted into Nature Genetics.
- Fabbro, Shay et al. 2011. Homozygosity mapping with SNP arrays confirms 3p21 as a recessive locus for gray platelet syndrome and narrows the interval significantly. Blood. **117:** 3430-3434
- Fabbro, Shay and Nicholas W. Seeds. 2009. Tissue Plasminogen Activator Activity is Dramatically Reduced while Neuroserpin is up-regulated in the Alzheimer Disease Brain. Journal of Neurochemistry. **109:** 303-315.

Abstracts:

- Plasminogen Activator Inhibition in Alzheimer's Disease. Presented at the Experimental Biology meeting in San Diego, April 2008
- Plasminogen Activator Inhibition in Alzheimer's Disease. Presented at the Rocky Mountain Regional Neuroscience Group meeting in Denver, CO, May 2008
- The Role of the Plasminogen Activator System in Alzheimer's Disease. Presented at the Rocky Mountain Regional Neuroscience Group meeting in Denver, CO, May 2007
- The Plasminogen Activator System and its Inhibitors in Alzheimer's Disease. Presented at the Hartford Jahnigen Cognitive impairment meeting in Denver, January 2007

Appendix D

Assessment Plan and Curriculum Map

COLORADO MESA UNIVERSITY
Program Outcome and Assessment Plan Template

Program Name: Biological Sciences

Date: August 9, 2013

Program Outcomes	Courses/Educational Strategies Indicate if outcome is Beginning(B), Developing(D) or Advanced(A)	Assessment Method(s)	Time of Data Collection/ Person Responsible	Results of Assessment	Actions Taken
Outcome #1 Students will demonstrate a broad, comprehensive knowledge of the main areas of biology (including evolution, diversity, ecology, cell biology and genetics) and the ability to apply this knowledge to address new questions. (Specialized Knowledge)	Core courses: BIOL 105/105L (B) BIOL106/106L (B) BIOL 107/107L (B) BIOL 208/208L (D) BIOL 301/301L (D) Major Fields Test (A) Exit survey (A)	What: Exam questions or assignments in the courses How: Assessment embedded questions What: National Test How: Assessment indicators cover diversity of organisms, animals, plants, population genetics and evolution, and ecology What: Exit survey given to graduating seniors How: Questions on the survey relate to the student's feelings about their level of biological knowledge	Who: All course instructors When: Either at the end of the semester during the semester, depending upon the course. Who: Campus testing center When: Semester before graduation Who: The administrative assistant for the department gathers exit surveys from graduating seniors When: Semester before graduation	Results: Key Findings: Conclusions:	Action: Re-evaluation Date:

Outcome #2 Students will demonstrate the ability to use science as a way of thinking and problem solving. They will be able to make key observations, ask questions, formulate hypotheses, design experiments, collect and analyze data, draw logical conclusions and explain and defend those conclusions to others. (Quantitative fluency/Applied Learning)	BIOL 105L (B)	What: Rubric for grading lab reports. How: The reports will demonstrate the student's ability to collect and analyze data, and explain conclusions	Who: All instructors When: As students complete written assignments related to the laboratory experiments	Results: Key Findings: Conclusions:	Action: Re-evaluation Date:
	BIOL 301L (D)	What: Rubric for grading both written and oral presentations How: students will design experiments, analyze data, and explain conclusions in both written and oral form	Who: All instructors When: Students complete a semester long genetics experiment		
	Major Fields Test (A)	What: National Test How: Assessment indicator for analytical skills	Who: Campus testing center When: Semester before graduation		
	Exit Survey (A)	What: Exit survey given to graduating seniors How: Questions on the survey relate to the student's feelings about their critical thinking skill, quantitative reasoning, as well as written and oral communication skills	Who: The administrative assistant gathers exit surveys from graduating seniors When: Semester before graduation		
Outcome #3 Students will demonstrate the ability to critically search, read, evaluate and discuss primary literature.	BIOL 107L (B)	What: Assignments related to primary literature How: Grading rubric to indicate the level of understanding	Who: Course instructors When: During the semester	Results: Key Findings: Conclusions:	Action: Re-evaluation Date:

Outcome #3 **Students will demonstrate the ability to critically search, read, evaluate and discuss primary literature.** **(Critical Thinking)**	**BIOL 107L (B)** **BIOL 301 (D)** **BIOL 483 (A)**	**What: Assignments related to primary literature** **How: Grading rubric to indicate the level of understanding** **What: Assignments related to current topics in genetics** **How: Grading rubric to indicate discussion of current topics** **What: Students search biological primary literature to prepare an in-depth thesis** **How: Grading rubric**	**Who: Course instructors** **When: During the semester** **Who: Course Instructors** **When: During the semester** **Who: Course instructors** **When: At the end of the semester**	**Results:** **Key Findings:** **Conclusions:**	**Action:** **Re-evaluation Date:**
Outcome #4 **Students will demonstrate effective Biological communication skills, both in writing and orally.** **(Communication fluency)**	**BIOL 105L (B)** **BIOL 107L (D)**	**What: Lab reports** **How: Grading rubric** **What: Written report and poster presentation on the "unknown" plants grown over the course of the semester.** **How: Grading rubric.**	**Who: Course Instructors** **When: During the semester** **Who: Course instructors** **When: End of semester**	**Results:** **Key Findings:** **Conclusions:**	**Action:** **Re-evaluation Date:**

Template

adapted from Long Beach City College and Indiana State University Assessment Plans

Basic (B): retention and comprehension
Developing (D): analysis and application
Advanced (A): evaluation and creation

The core courses for the Biology program are BIOL 105/105L Attributes of Living Systems; 106/106L Principles of Animal Biology; 107/107L Principles of Plant Biology; 208/208L Fundamentals of Ecology and Evolution; 301/301L Principles of Genetics; and 483 Senior Thesis. Students then select additional course work in Biology, including at least one cell/molecular course chosen from BIOL 302 Cell Biology; 341/341L General Physiology; or 421/421L Plant Physiology.

Courses	SLOs	SLO 1	SLO 2	SLO 3	SLO 4
BIOL 493	Lab Teaching Practicum				
BIOL 487	Advanced Research		X	X	X
*BIOL 483	Senior Thesis			X	X
BIOL 482	Senior Research			X	X
BIOL 450/450L	Mycology	X		X	X
BIOL 442	Pharmacology	X			
BIOL 441	Endocrinology	X		X	
BIOL 433	Marine Invert Communities	X		X	X
BIOL 431/431L	Animal Parasitology	X	X		
BIOL 426/426L	Intro to Electron Microscopy	X			
BIOL 425	Molecular Genetics	X		X	
BIOL 423/423L	Plant Anatomy	X		X	X
BIOL 421/421L	Plany Physiology	X	X	X	X
BIOL 418/418L	Wildlife Mgmt/Fld Tech	X	X		
BIOL 416/416L	Ethology	X	X		
BIOL 415	Tropical Ecosystems	X			
BIOL 414/414L	Aquatic Biology	X	X		
BIOL 413/413L	Herpetology	X	X		
BIOL 412/412L	Ornithology	X	X		
BIOL 411/411L	Mammalogy	X	X		
BIOL 410/410L	Human Osteology	X			
BIOL 409/409L	Gross Dev and Human Anatomy	X			
BIOL 408	Desert Ecology	X			
BIOL 406	Plant-Animal Interactions	X			
BIOL 405/405L	Advanced Ecological Methods	X	X		
BIOL 403	Evolution	X	X	X	X
BIOL 387	Structured Research			X	X
BIOL 371L	Lab Invest in Cell and Molec Biol	X	X	X	X
BIOL 350/350L	Microbiology	X	X		
BIOL 344/344L	Forensic Molecular Biology	X	X		
BIOL 343	Immunology	X		X	
BIOL 342/342L	Histology	X			
BIOL 341/341L	General Physiology	X	X		X
BIOL 336	Fish Biology	X			
BIOL 335/335L	Invertebrate Zoology	X		X	X
BIOL 333	Marine Biology	X		X	X
BIOL 331/331L	Insect Biology	X			
BIOL 322/322L	Plant Identification	X		X	
BIOL 321/321L	Taxonomy of Grasses	X		X	X
BIOL 320	Plant Systematics	X		X	X
BIOL 315	Epidemiology	X			
BIOL 310/310L	Developmental Biology	X	X	X	X
BIOL 302	Cellular Biology	X			
*BIOL 301/301L	Principles of Genetics	X	X	X	
BIOL 250/250L	Intro to Medical Microbiology	X	X		
BIOL 241	Pathophysiology	X		X	
BIOL 211/211L	Ecosystem Biology	X			
BIOL 210/210L	Human Anat. and Physiol. II	X			
BIOL 209/209L	Human Anat. and Physiol.	X			
*BIOL 208/208L	Fundamentals of Ecol. Evol.	X			
BIOL 203	Human Nutrition	X			
*BIOL 107/107L	Principles of Plant Biology	X		X	X
*BIOL 106/106L	Principles of Animal Biology	X			
*BIOL 105/105L	Attributes of Living Systems	X	X		X
CMU Biology Graduates will be able to...					
1) Students will demonstrate a broad, comprehensive knowledge of the main areas of biology (including evolution, diversity, ecology, cell biology and and the ability to apply this knowledge to address new questions.					
2) Students will demonstrate the ability to use science as a way of thinking and problem solving. They will be able to make key observations, ask formulate hypotheses, design experiments, collect and analyze data, draw logical conclusions and explain and defend those concusions to others.					
3) Students will demonstrate the ability to critically search, read, evaluate and discuss primary literature.					
4) Students will demonstrate effective biological communication skills, both in writing and orally.					
*Required core courses					

Appendix E

Alumni and Exit Survey Results

Alumni Survey Results for Biology Graduates - 2013

(audience size of 204 - 12 completed survey)

Undergraduate Degree Questions

Overall, how satisfied are you with your undergraduate education?

	#	%
Very Satisfied	2	16.7%
Generally satisfied	8	66.7%
Ambivalent	1	8.3%
Generally Dissatisfied	1	8.3%
Very Dissatisfied	0	0.0%

Based on what you know now, how well do you think your undergraduate experience prepared you to:

	Very Well		More than Adequately		Adequately		Less Than Adequately		Very Poorly	
	#	%	#	%	#	%	#	%	#	%
Communicate effectively in the English Language	5	41.7%	3	25.0%	4	33.3%	0	0.0%	0	0.0%
Understand the structure and discipline of mathematical thought in problem solving	2	16.7%	4	33.3%	6	50.0%	0	0.0%	0	0.0%
Be aware of the great philosophical issues which have endured through the ages	0	0.0%	3	25.0%	3	25.0%	5	41.7%	1	8.3%
Have an understanding of the multicultral nature of our world	0	0.0%	5	41.7%	4	33.3%	3	25.0%	0	0.0%
Think critically	4	33.3%	3	25.0%	4	33.3%	0	0.0%	1	8.3%
Have an understanding of the complexities of social systems	1	8.3%	2	16.7%	7	58.3%	1	8.3%	1	8.3%
Have knowledge of the natural world	5	41.7%	4	33.3%	3	25.0%	0	0.0%	0	0.0%
Appreciate the contributions of literature to our perception of the world	0	0.0%	3	27.3%	6	54.5%	2	18.2%	0	0.0%
Appreciate the aesthetic spirit of humanity through the arts	0	0.0%	2	16.7%	6	50.0%	4	33.3%	0	0.0%
Posses the knowledge necessary to achieve a healthy lifestyle	2	16.7%	3	25.0%	3	25.0%	2	16.7%	2	16.7%
Acquire knowledge on your own	5	41.7%	4	33.3%	3	25.0%	0	0.0%	0	0.0%
Be an effective leader	2	16.7%	4	33.3%	3	25.0%	3	25.0%	0	0.0%

While an undergraduate, about how often did you have conversations with faculty outside of class?

	#	%
Never	0	0.0%
Rarely (1-2 times per semester)	3	25.0%
Occasionally (3-5 times per semester)	3	25.0%
Often (once every two weeks)	4	33.3%
Very Often (at least once a week)	2	16.7%

Would you encourage a current high school senior to attend CMU?

	#	%
Definitely Would	4	33.3%
Probably Would	5	41.7%
Maybe	3	25.0%
Probably Would Not	0	0.0%

Definitely Would Not	0	0.0%

What was your undergraduate major?

	#	%
Biological Sciences B.S.	11	91.7%
Biological Sciences with Teacher Certification - B.S.	1	8.3%

Undergraduate Degree Questions (continued)

In what year did you graduate from the major/certificate you chose above?

	#	%
2012	5	45.5%
2011	3	27.3%
2010	1	9.1%
2009	1	9.1%
2008	1	9.1%
2007	0	0.0%

How would you rate the overall quality of your education within that degree/certificate program?

	#	%
Very High	2	16.7%
High	7	58.3%
Average	2	16.7%
Low	1	8.3%
Very Low	0	0.0%

Job and Career Questions

Are you working for pay right now?

	#	%
Yes, work full-time	8	66.7%
Yes, work part-time	1	8.3%
No	3	25.0%

In what type of organization is your principal employment? Mark the one best answer.

Self-employed in own business or professional non-group practice	0
Private for profit corporation/company/group/group-practice	4
Higher education (public or private)	1
Elementary or secondary education (public or private)	0
International organization in the US	0
International organization outside of the US	0
US Military	0
Federal Government (except military)	0
State and local government, institution, or agency (except education)	0
Private non-profit organization (except education and international organizations)	2
Other -	2

Which of the following best describes your current position?

	#	%
Entry Level	4	44.4%
Mid-Level	3	33.3%
Senior Level	2	22.2%
Executive Level (except for chief executive)	0	0.0%
Chief Executive (CEO, COO, CFO, GM or principal in a business of other organization)	0	0.0%

How many years have you been in your current job type?

	#	%
Less than 3 years	4	44.4%
3-5 years	4	44.4%
6-9 years	1	11.1%
10 or more years	0	0.0%

Is your current position related to your undergraduate field(s) of study?

	#	%
Yes, related to major(s)	6	66.7%
No, not related	3	33.3%

Job and Career Questions (continued)

How well did CMU prepare you for your current career?

	#	%
Very Well	0	0.0%
More than Adequately	1	11.1%
Adequately	6	66.7%
Less Than Adequately	1	11.1%
Very Poorly	0	0.0%
NA	1	11.1%

Please mark the ranges below that most closely approximate your 2012 individual earnings and household income, before taxes.

	Individual			Household	
	#	%		#	%
None	0	0.0%		0	0.0%
Under $20,000	2	22.2%		0	0.0%
$20,000 - $29,999	2	22.2%		0	0.0%
$30,000 - $39,999	4	44.4%		0	0.0%
$40,000 - $49,999	0	0.0%		0	0.0%
$50,000 - $59,999	0	0.0%		2	66.7%
$60,000 - $74,999	0	0.0%		0	0.0%
$75,000 - $99,999	0	0.0%		1	33.3%
$100,000 - $149,999	1	11.1%		0	0.0%
$150,000 - $249,999	0	0.0%		0	0.0%
$250,000 - $499,999	0	0.0%		0	0.0%
Over $500,000	0	0.0%		0	0.0%

Comments about your work experience that will help improve CMU:

IT DIDNT. MY TECHNICAL CERTIFICATE IN PHLEBOTOMY ALLOWED ME TO GET A DECIENT JOB

Why are you not currently working for pay? (Please mark all that apply)

	# of times checked
I chose not to enter the workforce at this time.	0
It has been difficult to find a position in my field.	2
It has been difficult to find a position paying an appropriate salary.	0
I am raising a family.	1
I am currently a student.	1
I am doing volunteer work.	0
I am retired.	0
Other	0

Education since College

Have you enrolled in a graduate, professional, or other degree/certificate program since graduating from CMU?

	#	%
Yes	2	16.7%
No	5	41.7%
No, but I plan to enroll in the next two years.	5	41.7%

Are you enrolled in this program now?

	#	%
Yes, I am a full-time student	0	0.0%
Yes, I am a part-time student	0	0.0%
No	2	100.0%

What level of education are/were you pursing?

	#	%
Certificate	0	0.0%
Associate	0	0.0%
Baccalaureate	0	0.0%
Post-Bacc Certificate	0	0.0%
Master's	0	0.0%
J.D.	0	0.0%
Doctoral	2	100.0%
Other	0	0.0%

How many years after you finished the degree/certificate program this survey pertains to did you start this program?

	#	%
Immediately	1	50.0%
1 Year later	0	0.0%
2-3 years later	1	50.0%
4-6 years later	0	0.0%
7-10 years later	0	0.0%
11 or more years later	0	0.0%

Altogether, how many years have/did you attend(ed) further schooling? Mark the best answer.

	#	%
None	1	50.0%
1 to 2 years	0	0.0%
3 to 4 years	1	50.0%
5 to 6 years	0	0.0%
7 to 10 years	0	0.0%
11 or more years	0	0.0%

How well did CMU prepare you for this educational program?

	#	%
Very Well	0	0.0%
More than Adequately	1	50.0%
Adequately	1	50.0%
Less Than Adequately	0	0.0%
Very Poorly	0	0.0%
NA	0	0.0%

Did you complete this program?

	#	%
Yes	1	50.0%

No	0	0.0%
In the process of finishing	1	50.0%

Other comments about furthering your education: (none given)

Suggestions for improving the degree/certificate program:

- Offering more courses. I know this has been an issue with the size of CMU, but hopefully with all the recent growth the Science department can offer a larger variety of courses.
- NO Health and wellness or activities requirements. They are a scam, a massive waste of students time and money. All college students should know everything in the h and w course already- I NEVER attended and received an A plus. SCAM! Activity courses are ridiculous- what is this a university or an elementary school. Students already pay for access to the rev center. They should not have to pay to take recreation classes. That is completely absurd!
- Make a specialized Biology program. I have been passed up for many jobs because I went to CMU and all they have is a general biology program. People with a specialized biology degree are getting the jobs I apply for.
- M.S. In Biology and a professor more targeted to the aquatic sciences.
- I would like to see more opportunities for students to gain research experience and internships. Also, offering a program that students could earn while they simultaneously earn their B.S. degree would go a long way in giving them real life experience in the medical field. A certificate in phlebotomy or maybe a degree as a medical assistant could be earned in the students first or second year at CMU. This would give the student two to three years of work experience by the time they graduate.

- GET BETTER CHEM TEACHERS AND STOP MCKINNEY FROM TEACHING. SHE IS SMART BUT A POOR TEACHER.

Additional Comments:

- I enjoyed my time at CMU. The science department has some exceptional professors in it's department, but it also has a few professors who are on vacation (mentally) more than they are in class. It would be beneficial to have a department member whose entire job was to proctor intermittently every professors course to evaluate their teaching effectivity. This would keep professors on their toes a little more and the quality of education given would increase substantially.

- Medical schools look for more than just good grades and high test scores, they also want community involvement and job related experience. Highly motivated individuals will find these opportunities regardless, but if CMU offered a more comprehensive pre-med track with these things in mind, CMU could become a great place for future medical students to develop along side with their top notch nursing program. Students who are on the fence as to whether or not medicine is the path they want to take would have an easy way to find out if they are motivated/passionate enough to pursue the challenge. If CMU gained a reputation for cranking out highly competitive med students, high school students might be more inclined to enroll at CMU rather than a school that has name recognition like CU.

Demographic Questions

What is your gender?

	#	%
Male	4	33.3%
Female	8	66.7%
Prefer not to respond	0	0.0%

What is your ethnicity?

	#	%
American Indian or Alaskan Native	1	8.3%
Asian	0	0.0%
Black or African American	0	0.0%
Hispanic of any race	2	16.7%
Native Hawaiian or Pacific Islander	0	0.0%
White	8	66.7%
Two or more races	1	8.3%
Race and ethnicity unknown	0	0.0%
Non-Resident Alien (of any race or ethnicity)	0	0.0%
Prefer not to respond	0	0.0%

What is your current age?

	#	%
Under 21	0	0.0%
21-24	5	41.7%
25-34	7	58.3%
35-44	0	0.0%
45-54	0	0.0%
55 or older	0	0.0%
Prefer not to respond	0	0.0%

Do you live in the state of Colorado?

	#	%
Yes	7	58.3%
No	5	41.7%

If yes, do you live in Western Colorado?

	#	%
Yes	5	62.5%
No	3	37.5%

Alumni Survey Results for All Respondents - 2013

Undergraduate Degree Questions

Overall, how satisfied are you with your undergraduate education?

	#	%
Very Satisfied	11	36.7%
Generally satisfied	14	46.7%
Ambivalent	1	3.3%
Generally Dissatisfied	3	10.0%
Very Dissatisfied	1	3.3%

Based on what you know now, how well do you think your undergraduate experience prepared you to:

	Very Well		More than Adequately		Adequately		Less Than Adequately		Very Poorly	
	#	%	#	%	#	%	#	%	#	%
Communicate effectively in the English Language	19	63.3%	6	20.0%	5	16.7%	0	0.0%	0	0.0%
Understand the structure and discipline of mathematical thought in problem solving	4	13.3%	12	40.0%	13	43.3%	0	0.0%	1	3.3%
Be aware of the great philosophical issues which have endured through the ages	10	33.3%	8	26.7%	5	16.7%	6	20.0%	1	3.3%
Have an understanding of the multicultral nature of our world	6	20.0%	13	43.3%	8	26.7%	3	10.0%	0	0.0%
Think critically	14	46.7%	6	20.0%	9	30.0%	0	0.0%	1	3.3%
Have an understanding of the complexities of social systems	11	36.7%	5	16.7%	11	36.7%	2	6.7%	1	3.3%
Have knowledge of the natural world	11	37.9%	9	31.0%	9	31.0%	0	0.0%	0	0.0%
Appreciate the contributions of literature to our perception of the world	7	24.1%	7	24.1%	11	37.9%	4	13.8%	0	0.0%
Appreciate the aesthetic spirit of humanity through the arts	4	13.8%	6	20.7%	13	44.8%	6	20.7%	0	0.0%
Posses the knowledge necessary to achieve a healthy lifestyle	8	27.6%	7	24.1%	9	31.0%	3	10.3%	2	6.9%
Acquire knowledge on your own	16	53.3%	7	23.3%	7	23.3%	0	0.0%	0	0.0%
Be an effective leader	9	30.0%	10	33.3%	8	26.7%	3	10.0%	0	0.0%

While an undergraduate, about how often did you have conversations with faculty outside of class?

	#	%
Never	0	0.0%
Rarely (1-2 times per semester)	3	10.0%
Occasionally (3-5 times per semester)	8	26.7%
Often (once every two weeks)	8	26.7%
Very Often (at least once a week)	11	36.7%

Would you encourage a current high school senior to attend CMU?

	#	%
Definitely Would	16	53.3%
Probably Would	9	30.0%
Maybe	5	16.7%

Probably Would Not	0	0.0%
Definitely Would Not	0	0.0%

Undergraduate Degree Questions (continued)

In what year did you graduate from the major/certificate you chose above?

	#	%
2012	8	30.8%
2011	7	26.9%
2010	3	11.5%
2009	2	7.7%
2008	4	15.4%
2007	2	7.7%

How would you rate the overall quality of your education within that degree/certificate program?

	#	%
Very High	12	40.0%
High	12	40.0%
Average	3	10.0%
Low	2	6.7%
Very Low	1	3.3%

Job and Career Questions

Are you working for pay right now?

	#	%
Yes, work full-time	15	50.0%
Yes, work part-time	4	13.3%
No	11	36.7%

In what type of organization is your principal employment? Mark the one best answer.

Self-employed in own business or professional non-group practice	0
Private for profit corporation/company/group/group-practice	4
Higher education (public or private)	3
Elementary or secondary education (public or private)	0
International organization in the US	0
International organization outside of the US	0
US Military	1
Federal Government (except military)	1
State and local government, institution, or agency (except education)	2
Private non-profit organization (except education and international organizations)	5
Other -	3

Which of the following best describes your current position?

	#	%
Entry Level	9	47.4%
Mid-Level	7	36.8%
Senior Level	2	10.5%
Executive Level (except for chief executive)	0	0.0%
Chief Executive (CEO, COO, CFO, GM or principal in a business of other organization)	1	5.3%

How many years have you been in your current job type?

	#	%
Less than 3 years	11	57.9%
3-5 years	6	31.6%
6-9 years	2	10.5%

10 or more years	0	0.0%

Job and Career Questions (continued)

Is your current position related to your undergraduate field(s) of study?

	#	%
Yes, related to major(s)	12	63.2%
No, not related	7	36.8%

How well did CMU prepare you for your current career?

	#	%
Very Well	4	21.1%
More than Adequately	3	15.8%
Adequately	8	42.1%
Less Than Adequately	2	10.5%
Very Poorly	0	0.0%
NA	2	10.5%

Please mark the ranges below that most closely approximate your 2012 individual earnings and household income, before taxes.

	Individual			Household	
	#	%		#	%
None	0	0.0%		0	0.0%
Under $20,000	4	22.2%		0	0.0%
$20,000 - $29,999	4	22.2%		0	0.0%
$30,000 - $39,999	5	27.8%		0	0.0%
$40,000 - $49,999	1	5.6%		0	0.0%
$50,000 - $59,999	1	5.6%		2	66.7%
$60,000 - $74,999	2	11.1%		0	0.0%
$75,000 - $99,999	0	0.0%		1	33.3%
$100,000 - $149,999	1	5.6%		0	0.0%
$150,000 - $249,999	0	0.0%		0	0.0%
$250,000 - $499,999	0	0.0%		0	0.0%
Over $500,000	0	0.0%		0	0.0%

Why are you not currently working for pay? (Please mark all that apply)

	# of times checked
I chose not to enter the workforce at this time.	1
It has been difficult to find a position in my field.	5
It has been difficult to find a position paying an appropriate salary.	2
I am raising a family.	1
I am currently a student.	5
I am doing volunteer work.	2
I am retired.	0
Other	2

Education since College

Have you enrolled in a graduate, professional, or other degree/certificate program since graduating from CMU?

	#	%
Yes	12	40.0%
No	8	26.7%
No, but I plan to enroll in the next two years.	10	33.3%

Are you enrolled in this program now?

	#	%
Yes, I am a full-time student	7	58.3%
Yes, I am a part-time student	1	8.3%
No	4	33.3%

What level of education are/were you pursing?

	#	%
Certificate	0	0.0%
Associate	0	0.0%
Baccalaureate	3	27.3%
Post-Bacc Certificate	0	0.0%
Master's	2	18.2%
J.D.	2	18.2%
Doctoral	4	36.4%
Other	0	0.0%

How many years after you finished the degree/certificate program this survey pertains to did you start this program?

	#	%
Immediately	7	58.3%
1 Year later	2	16.7%
2-3 years later	3	25.0%
4-6 years later	0	0.0%
7-10 years later	0	0.0%
11 or more years later	0	0.0%

Altogether, how many years have/did you attend(ed) further schooling? Mark the best answer.

	#	%
None	1	8.3%
1 to 2 years	6	50.0%
3 to 4 years	4	33.3%
5 to 6 years	1	8.3%
7 to 10 years	0	0.0%
11 or more years	0	0.0%

How well did CMU prepare you for this educational program?

	#	%
Very Well	3	25.0%
More than Adequately	4	33.3%
Adequately	4	33.3%
Less Than Adequately	1	8.3%
Very Poorly	0	0.0%
NA	0	0.0%

Did you complete this program?

#	%

Yes	2	16.7%
No	1	8.3%
In the process of finishing	9	75.0%

Demographic Questions

What is your gender?

	#	%
Male	10	33.3%
Female	20	66.7%
Prefer not to respond	0	0.0%

What is your ethnicity?

	#	%
American Indian or Alaskan Native	1	3.3%
Asian	0	0.0%
Black or African American	1	3.3%
Hispanic of any race	3	10.0%
Native Hawaiian or Pacific Islander	0	0.0%
White	21	70.0%
Two or more races	3	10.0%
Race and ethnicity unknown	0	0.0%
Non-Resident Alien (of any race or ethnicity)	0	0.0%
Prefer not to respond	1	3.3%

What is your current age?

	#	%
Under 21	0	0.0%
21-24	10	33.3%
25-34	17	56.7%
35-44	0	0.0%
45-54	2	6.7%
55 or older	1	3.3%
Prefer not to respond	0	0.0%

Do you live in the state of Colorado?

	#	%
Yes	21	70.0%
No	9	30.0%

If yes, do you live in Western Colorado?

	#	%
Yes	13	54.2%
No	11	45.8%

Biology Exit Survey Fall 2009-Spring 2013

Percentage that are somewhat or very satisfied:

	2009	2010	2011	2012
Availability of Biology Classes	62.5	87	57	63
Access to Faculty	87	100	100	100
Content and Structure of the Major	87	93	100	100
Quality of Advising	62	75	71	81
Overal Quality of Assistance	81	87	92	100
Qualitie of Facilities and Equipment	44	69	92	90

Percentage that agree or strongly agree:

Faculty members are interested in my progress.	81	81	100	100
There were opportunites to participate in independent projects.	56	56	85	64
Course content reflects current trends in my field.	69	87	78	90

Percentage scoring a 4 or 5, with 5 being "a great deal":

Gave me a sense of competence in my major field of study.	75	93	85	90
Allowed me to relate theory to practical situtations.	62	81	71	82
Helped me enhance my critical thinking skills.	75	93	78	90
Helped me enhance my quantittive reasoning skills.	69	93	92	90
Helped me enhance my written communication skillls.	87	87	78	90
Helped me enhance by oral communication skills.	87	81	85	90
Helped me enhance my practical laboratory and/or field skills.	93	93	85	90

Biological Sciences Graduation Exit Survey
Colorado Mesa University

In order for us to evaluate and improve our program delivery, please take a few moments to fill out the survey below and return it to the Chair of the Biology Department (WS 228D) or the Administrative Assistant (WS232). You do not need to put your name on the survey. If you wish to mail the form back, the address is

Chair, Biological Sciences
Colorado Mesa University
1100 North Avenue
Grand Junction, CO 81501-3122

1. What is your major?
   _____ BS in Biological Sciences
   _____ BS in Biological Sciences – Premed/Preprofessional
   _____ BS in Biological Sciences - Secondary Teacher Certification
   _____ AS in Biological Sciences

2. What is your sex (optional)?
   _____ female
   _____ male

3. What was your class standing when you entered the biology program at CMU?
   _____ Freshman (first time)
   _____ Freshman (transfer)
   _____ Sophomore
   _____ Junior
   _____ Senior

4. Have you primarily been a full-time or part-time student?
   _____ full-time
   _____ part-time

5. While at CMU, during the academic semesters did you work outside of school
   _____ mostly part-time?
   _____ mostly full-time?
   _____ intermittently?
   _____ not at all?

6. How much difficulty did you have financing your studies at CMU?
   _____ no difficulty
   _____ some difficulty
   _____ great difficulty

7. Which best describes your post-graduation plans?
   _____ job related to biology
   _____ graduate school (Masters or PhD) or professional school (MD, DVM, etc.)
   _____ job not related to biology
   _____ military
   _____ teaching

8. Please rate the criteria below based on your experiences in Biology at CMU.

8.1 Availability of Biology classes
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.2 Availability of Physical Sciences classes
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.3 Usefulness of texts and course materials
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.3 Access to faculty
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.5 Content and structure of the major
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.6 Quality of advising about coursework in your major
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.7 Overall quality of assistance provided by the department
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.8 Opportunities for useful non-classroom experiences

_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

8.9 Quality of facilities and equipment in the laboratories

_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

9. Please indicate your level of agreement/disagreement with the following statements.

9.1 My major program was too difficult academically.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.2 Required courses were offered with reasonable frequency.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.3 Class sizes were conducive to learning.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.4 Faculty members were genuinely interested in my progress.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.5 There were opportunities to participate in independent projects, internships, and community service.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.6 Course content reflected current trends in my field.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.7 Degree requirements were relevant to my professional goals.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.8 I would recommend the Biology Program to others interested in my field of study.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

9.9 I think CMU should develop and offer a Master's degree in Biology.

_____ strongly agree
_____ agree
_____ neither agree nor disagree
_____ disagree
_____ strongly disagree

10. On a scale of 1 to 5, with 1 being "not at all" and 5 being "a great deal," please rate how our program helped you with the following skill areas.

10.1 Gave me a sense of competence in my major field of study

1 2 3 4 5

10.2 Provided the foundation for graduate study

1 2 3 4 5

10.3 Helped me understand current issues

1 2 3 4 5

10.4 Allowed me to relate theory to practical situations

1 2 3 4 5

10.5 Helped me understand human diversity

1 2 3 4 5

10.6 Helped me to learn to access information from electronic databases and bibliographic print sources

1 2 3 4 5

10.7 Helped me enhance my critical thinking skills

1 2 3 4 5

10.8 Helped me enhance my quantitative reasoning skills

1 2 3 4 5

10.9 Helped me enhance my written communication skills

1 2 3 4 5

10.10 Helped me enhance my oral communication skills

1 2 3 4 5

10.11 Helped me enhance my practical laboratory and/or field skills

1 2 3 4 5

11. How well has your education in the Biology Program prepared you for a career or advanced study?
_____ extremely well
_____ very well
_____ moderately well
_____ slightly well
_____ not very well

12. How satisfied are you with your overall experience at CMU?
_____ very satisfied
_____ somewhat satisfied
_____ neither satisfied nor dissatisfied
_____ somewhat dissatisfied
_____ very dissatisfied

13. If you have any additional comments, please write them in the space below. Thank you for completing this survey.

Appendix F

General Education Assessments

GENERAL EDUCATION ASSESSMENT REPORT

Biology 101, General Human Biology
(Gen Ed Course - Department, Number, Title of Course)

Fall/Spring 2010
(Assessment Period Covered)

September 16th, 2011
(Date Submitted)

Submitted By: Margot Becktell

General Education Objectives addressed by this course: (List a minimum of two)

1. Have knowledge of the natural world and an understanding of the scientific method

2. Possess the knowledge and skills necessary to achieve a healthy lifestyle

General Education Objective #1:

First Means of Assessment for GE Objective #1:

1a. First Means of Assessment and Criteria for Success: Biology 101 covers a wide array of topics associated with human biology. Faculty teaching the course assessed whether the scientific method and knowledge of the natural world were understood by designing multiple choice questions to include on exams following the coverage of material related to this objective in their course (course embedded questions). The questions were given equal weight in the overall exam score. All of the questions were scored with scantrons; the percent of students who answered the questions correctly/incorrectly was determined based on the scantron results.

At least two questions were used to address each of three broad topics agreed upon by all instructors teaching the course:

1. Understand the role of the scientific method in the search for facts.
   Questions related to this topic are coded 1-1a and 1-1-b in the table below.
2. Understand how DNA dictates phenotype/genotype
   Questions related to this topic are coded 1-2a and 1-2b in the table below.
3. Understand the relevance of mitosis/meiosis to growth, reproduction, disease, cancer or genetic diversity.
   Questions related to this topic are coded 1-3a and 1-3b in the table below.

1a. Summary of Assessment Data Collected:

Results for Objective 1		
Questions	Average % of students answering the question correctly	Sample size
1-1a	76	425
1-1b	73	425
1-2a	70	345
1-2b	75	345
1-3a	71	195
1-3b	63	216

1a. Use of Results to Improve Gen Ed Course: Please see discussion under 2a.

Example questions used to assess Objective 1. ***Have knowledge of the natural world and an understanding of the scientific method.***

Example questions that addressed Objective 1-1: Understand the role of the scientific method in the search for facts

An idea supported by many observations, experiments, and data and is considered valid by a majority of scientists is:

A. An example of deductive reasoning
B. A theory
C. A hypothesis
D. A controlled experiment
E. Inductive thought

A hypothesis

F. Is supported by observations, experiments and data
G. Is a tentative explanation for a problem/question
H. Is accepted as true by a majority of scientists
I. Requires controlled experiments
J. Explains the natural world

Which of the following best describes the proper sequence of steps involved in the scientific method?
a. state hypothesis b. observe c. experiment d. support or disprove hypothesis e. form a prediction

A) e, b, a, c, d
B) a, b, c, d, e
C) b, a, d, e, c
D) b, a, e, c, d
E) a, b, c, e, d

Which if the following is the correct order for the scientific method?
A) conclusion, hypothesis, experiment, observation
B) experiment, hypothesis, observation, conclusion
C) observation, hypothesis, experiment, conclusion
D) hypothesis, experiment, observation, conclusion

A farmer wants to improve crop yield in his fields by testing the effectiveness of a new pesticide available on the market. Which of the following is the best control for this experiment?

A) no new pesticide used on the control field; new pesticide used only on the experimental field
B) a higher concentration of new pesticide used on the control field than the experimental field
C) less new pesticide used on the control field than the experimental field
D) more shade on the control field than the experimental field
E) more water on the control field than the experimental field

Example questions that addressed Objective 1-2: Understand how DNA dictates phenotype/genotype.

"In humans, the ability to roll the tongue is a dominant trait; the inability to roll the tongue is a recessive trait."

If two individuals heterozygous for this trait have a child, what is the chance that the child will not be able to roll his tongue?
A) 75%
B) 0%
C) 100%
D) 50%
E) 25%

A biological isolating mechanism where babies are aborted at an early stage because chromosome numbers are not the same (or the paired chromosomes do not match up correctly) is:
A) hybrid sterility
B) gamete mortality
C) zygote mortality

Normally, a person with two X chromosomes (XX) is:
A) Male
B) Female

Using the Punnet square: If these parents have 4 children, what percent of their offspring will have fine body hair? (Note: students are given additional info on the exam that is not shown here).
A) 0%
B) 25%
C) 50%
D)75%
E) 100%

A plant has red flowers (RR). What is the plant's genotype?
A) RR
B) red flowers
C) rr
D) recessive

Example questions that addressed Objective 1-3: Understand the relevance of mitosis/meiosis to growth, reproduction, disease cancer or genetic diversity.

Which are true of meiosis?
A) Meiosis occurs throughout the body resulting in growth
B) Meiosis results in new cells with half of the parental chromosomes
C) Meiosis of parent cells occurs only in the reproductive organs
D)Both A and B
E) Both B and C

In cell division the following occurs in Mitosis:
A) Diploid cell divides to produce 2 diploid cells
B) Diploid cell divides to produce 4 diploid cells
C) Diploid cell divides to produce 4 haploid cells/gametes
D) Haploid cell divides to produce 2 haploid cells
E) Haploid cell divides to produce 1 haploid cell

Tumor suppressor genes function to
A) Prevent release of growth factors
B) Stimulate metastasis
C) Slow down unchecked cell growth, differentiation, division or adhesion
D)Produce proto-oncogenes
E) Prevent gene expression of oncogenes

For humans mitosis is important during growth, repair or damaged tissue and for replacing old cells, whereas meiosis is important for reproduction, i.e. to produce gametes such as ovum and sperm.
A) True
B) False

All of the following are phases of mitosis EXCEPT:
A) anaphase
B) mitotic phase
C) telophase
D) metaphase

What form of cell division is responsible for producing haploid gametes?
A) mitosis
B) meiosis
C) tetrad
D) cell cycle

General Education Objective #2:
First Means of Assessment for GE Objective #2

2a. First Means of Assessment and Criteria for Success: The second objective was assessed in the same manner as the first objective. Faculty teaching the course assessed whether the students possessed the knowledge and skills necessary to achieve a healthy lifestyle by designing multiple choice questions to include on exams following the coverage of material related to this objective in their course (course embedded questions). The questions were given equal weight in the overall exam score. All of the questions were scored with scantrons; the percent of students who answered the questions correctly/incorrectly was determined based on the scantron results.
At least two questions were used to address each of three broad topics agreed upon by all instructors teaching the course:

1. Understanding of male/female reproductive processes.
   Questions related to this topic are coded 2-1a and 2-1-b in the table below.
2. Implications of human interactions with the environment.
   Questions related to this topic are coded 2-2a and 2-2b in the table below.
3. Causes of disease: genetic, diet, lifestyle, or other disease causing agents.
   Questions related to this topic are coded 2-3a and 2-3b in the table below.

2a. Summary of Assessment Data Collected:

Results for Objective 2

Questions	Average % of students answering the question correctly	Sample size
2-1a	77	324
2-1b	67	323
2-2a	83	277
2-2b	82	277
2-3a	83	327
2-3b	72	241

2a. Use of Results to Improve Gen Ed Course:
With the exception of two questions, the average % correct for the questions used to assess the both objectives was within the 70-80% range. We consider this to be acceptable and in line with our expectations for a general education, natural science course. The low scores of 63% and 67% for objective one and two, respectively, may indicate some gaps in the communication of some of the material. The faculty who teach Biology 101 are in agreement that an average score of 70% is appropriate and achievable; faculty work to make appropriate adjustments in delivery of the material and wording of test questions each time they teach the course. It is also worth noting that the range of material covered in Biology 101 courses is not fully represented by the few questions used for assessment. In addition, we do not "curve" the grades in this course, so the percentages reported represent the true percentage of students who had an acceptable level of understanding of the material. In conclusion, we are satisfied with the results, but will continue to adjust and improve the course where needed.

Questions used to assess Objective 2. ***Possess the knowledge and skills necessary to achieve a healthy lifestyle.***

Example questions that addressed Objective 2-1: Understanding the male/female reproductive processes.

At puberty the Hypothalamus begins to release GnRH (gonadotropin releasing hormone), this triggers the release of which hormone(s) from the Anterior Pituitary in both the male and female?
A) Estrogen
B) Testosterone
C) FSH – follicle stimulating hormone
D)Both A & B
E) Both C & D

Pregnancy occurs when:
A) the sperm and egg combine
B) the egg is ovulated
C) the developing embryo implants itself in the uterus
D)sperm are in the vagina
E) sperm are in the uterus

In female mammals one meiosis event results in ___ ovum(s) (egg(s)) and 2-3 polar bodies, where as in males ___ sperm(s) is/are produced per meiosis.
A) 2,4
B) 1,4
C) 4,4
D) 4,1
E) 4,2

How many chromosomes so sperm contain?
A) 11 autosomal and Y
B) 23 autosomal
C) 22 autosomal and X or Y
D) 44 autosomal and 2X
E) 44 autosomal and X and Y

Which hormone form the testis reduces sperm production:
A) Lutienizing hormone
B) Inhibin
C) Gonadotrophic releasing hormone
D) Testosterone
E) Follicle stimulating hormone

The seminiferous tubules:
A) are found in the ovary and produce eggs
B) are in the testes and have cells undergoing meiosis to produce sperm
C) are attached to the liver and secrete digestive enzymes
D) carry sperm to the urethra

Example questions that addressed Objective 2-2: Implications of human interactions with the environment.

Water pollution can take many forms; how does biodegradable waste from sewage, tanneries, paper plants and food processing plants cause the die off of organisms in the water (from microorganisms to fish)?

A) Carbon dioxide build up in the water
B) Depletion of oxygen in the water
C) Starvation due to lack of nutrients
D) Biodegradable waste is not a pollutant
E) None of the above

In the last 100 years the average global temperature has increased 1.0 degree Celcius. Which of the following are projected changes to the global climate if global warming continues?

A) Increase in intensity & duration of heat waves
B) Increase in the frost free period resulting in a longer growing season
C) Precipitation will change resulting in increased precipitation near the poles and decreased precipitation near the equator.
D) Increase in heavy precipitation events resulting in flooding
E) Only A, B & C
AB) All of the above

The maximum population that the environment can support for a certain period is called

A) Biotic potential
B) Carrying capacity
C) Environmental resistance
D) Demographic transition

Which of the following is responsible for making rainfall slightly acid in the absence of pollution in the air?

A) Chlorofluorocarbons
B) Sulfur dioxide
C) Carbon dioxide
D) Nitrogen dioxide
E) Chlorinated hydrocarbons

Over a billion pounds of pesticides are applied per year in the U.S. alone, but only ___% of that actually reaches the targeted pest. The rest just goes into the environment.

A) 0.1%
B) 1%
C) 10%
D) 20%
E) 40%

All of the following are things we can do to help pollution EXCEPT:

A) recycle
B) use environmentally safe products
C) carpool
D) drink bottled water

Example questions that addressed Objective 2-3: Causes of disease: genetic, diet, lifestyle, other disease causing agents

Which kind of pathogen causes these diseases: AIDS, Herpes, Chickenpox, Flu, colds....
A) Prions
B) Bacteria
C) Fungi
D) Viruses

Bovine spongiform encephalopathy, a.k.a. mad cow disease, is thought to be caused by a _____, which is a misfolded form of a normal brain cell protein.
A) Virus
B) Prion
C) Bacteria
D) Stem cell

Viruses are hard to cure because
A) Viruses mate frequently
B) Viruses hid in our own cells
C) Stopping virus replication stops our own cells' replication
D) All of the above

Hypertension is dangerous because it can lead to
A) Kidney disease
B) Intestinal blockage
C) Diabetes
D) All of the above

Which of the following vitamins help to regulate calcium metabolism, suppresses some form of leukemia, reduces hearing loss and helps some forms of diabetes?
A) A
B) B
C) C
D) D
E) E

With biological magnification, where does methyl mercury (soluble Hg) accumulate in the body causing cells to die? Hint: remember Minamata Japan
A) Lungs
B) Liver
C) Brain
D) Heart
E) Reproductive tract

Look at the human karyotype below (Note: students are given additional info not shown here)
What type of mutation is this?
A) Gene mutation – frame shift
B) Gene mutation – point mutation
C) Chromosome mutation – Polyploidy (3N)
D) No mutation – normal human karyotype

What is the most common cause of heart failure and heart attacks (myocardial infarction)?
A) coronary artery disease
B) too little calcium
C) too little fats in the diet
D) bacterial infection

GENERAL EDUCATION ASSESSMENT REPORT

BIOL 102/102L General Organismal Biology
(Gen Ed Course - Department, Number, Title of Course)

2009-2010 **October 4, 2010**
(Assessment Period Covered) **(Date Submitted)**

Submitted By: **Denise McKenney, Professor of Biology**

General Education Objectives addressed by this course: (List a minimum of two)

1. Have knowledge of the natural world and an understanding of scientific methods.

2. Be able to communicate effectively in the English language.

(Please Copy and Paste to create space for additional GE Objectives, if necessary)

General Education Objective #1: Have knowledge of the natural world and an understanding of scientific methods.

First Means of Assessment for GE Objective #1:

1a. First Means of Assessment and Criteria for Success: Administer a pre- and post test covering scientific methods and general Biology information. Success would be 80% correct answers on the post-test.

1a. Summary of Assessment Data Collected: The average pre-test score was 45% and the average post-test score was 63%

1a. Use of Results to Improve Gen Ed Course: These results are disappointing for two reasons. First, the goal of 80% correct was not reached. Second, if students begin the course with an average score of 45%, that indicates that nearly half the class is already familiar with scientific method and general Biology information. And the post-test score did not indicate much improvement.

To improve the gen ed course, we will re-evaluate the questions given, as well as the timing of the questions. For the next evaluation cycle, we will examine the choice of questions, and perhaps change to broader concept questions rather than such specific ones. As for timing of the post-test, this year, post test questions were asked during the final exam, but the exam is not comprehensive. Instead, post-test questions should be imbedded into each of the exams that actually cover the concepts.

Second Means of Assessment for GE Objective #1: Have knowledge of the natural world and an understanding of scientific methods.

1b. Second Means of Assessment and Criteria for Success: Average rating for Exit survey question 10.4 "Allowed me to relate theory to practical situation". Students rate how our program helped them with the specific skill area, with 1 being "not at all" and 5 being "a great deal". Criteria for success would be an average score of 4.

1b. Summary of Assessment Data Collected:
The average score was 3.6.

1b. Use of Results to Improve Gen Ed Course: This assessment tool is problematic because it is giving to our graduating Biology students, and is really not a great tool for gen ed assessment. The overall score of 3.6 does indicate that perhaps all our course work should include the relationship of scientific method to the real world. We are still looking for a better assessment tool for this one.

General Education Objective #2: Be able to communicate effectively in the English language.

First Means of Assessment for GE Objective #2

2a. First Means of Assessment and Criteria for Success: Pre-test and post-test essay. Criteria for success would be that at least 50% of the students pass the post-test essay with no errors.

2a. Summary of Assessment Data Collected: On the pre-test, only 2.1% of the students passed the essay with no errors. On the post-test, 53.9% passed with no errors.

2a. Use of Results to Improve Gen Ed Course: We met our goal on this assessment. We will continue to have a writing component to the course.

Second Means of Assessment for GE Objective #2

2b. Second Means of Assessment and Criteria for Success: Average rating for Exit survey question 10.9 "Helped me enhance my written and communication skills". Students rate how our program helped them with the specific skill area, with 1 being "not at all" and 5 being "a great deal". Criteria for success would be an average score of at least 4.

2b. Summary of Assessment Data Collected: The average score was 4.2.

2b. Use of Results to Improve Gen Ed Course: Although the exit survey is not the best tool for gen ed assessment, we did met our goal of an average score of at least 4. We include communication skills in many of our courses, including our gen ed science courses. We will continue to emphasize writing skills.

(Please Copy and Paste to create pages for additional GE Objectives, if necessary)

Please attach copies of multiple choice questions used or rubrics used for scoring papers or essays.

Copy of pre- and post-test:

Biol 102 Assessment Questions

1. An idea supported by many observations, experiments, and data and is considered valid by a majority of scientists is:
   A. An example of deductive reasoning
   B. A theory
   C. A hypothesis
   D. A controlled experiment
   E. Inductive thought

2. A hypothesis
   A. Is supported by observations, experiments and data
   B. Is a tentative explanation for a problem/question
   C. Is accepted as true by a majority of scientists
   D. Requires controlled experiments
   E. Explains the natural world

3. Which of the following have nitrogenous bases correctly paired in DNA?
   A. adenine-guanine (A-G); thymine-cytosine (T-C)
   B. adenine-uracil (A-U); guanine-cytosine (G-C)
   C. adenine-thymine (A-T); guanine-cytosine (G-C)
   D. adenine-adenine (A-A); guanine-guanine (G-G)
   E. adenine-cytosine (A-C); guanine-thymine (G-T)

4. A gene is physically located on
   A. DNA
   B. RNA
   C. enzymes
   D. proteins

5. How many chromosomes does a normal cell have?
   A. 46
   B. 100
   C. 45,000
   D. 3 billion

6. Which of the following is <u>not</u> one of the characteristics of "life" discussed in the first chapter of your book;

A. responds to stimuli
B. reproduces
C. adapts and evolves
D. takes materials and energy from the environment
E. has DNA within a nucleus

7. Which of the following critters from the Kingdom Protista, is known for it's cillia:
   A. euglena
   B. paramecium
   C. amoeba
   D. bacteria
   E. sperm.

8. Which of the following Phyla has the fluke and tapeworm in it?
   A. Nematoda
   B. Cnidaria
   C. Annelida
   D. Crustacea
   E. Platyhelminthes.

9. Which of the following is recognized by an exoskeleton and a complex, instinctive, and occasionally "social" set of behavior patterns?
   A. Annelida
   B. Platyhelminthese
   C. Insecta
   D. Crustacea
   E. Mollusca.

10. Which of the following is more modern (highly evolved) than Amphibia?
   A. Osteichthyes
   B. Chondrichtyes
   C. Aves
   D. Arthropoda
   E. Molluska.

11. The general function of the cotyledon is to supply an embryo with;
   A. water
   B. minerals
   C. support
   D. food
   E. carbon dioxide.

12. Water and minerals are carried to the leaf from the roots by:
   A. xylem
   B. cambium
   C. apical meristem cells
   D. phloem

E. companion cells.

13. Which of the following plant hormones is responsible for phototropism:
    A. auxin, IAA
    B. cytokinitin
    C. gibberellic acid, GA
    D. abcissic acid, ABA
    E. ethylene

14. The major raw material(s) absorbed by plants for use in photosynthesis is\are:
    A. carbon dioxide
    B. sugar
    C. oxygen
    D. minerals and nutrients from the soil
    E. vitamins.

15. In the chemical equation for photosynthesis is, carbon dioxide plus water, in the presence of sunlight energy, yields sugar plus
    A .florescence
    B. ATP (energy)
    C. carbohydrates
    D. oxygen
    E. CO2

16. The majority of "species" of plants are found in which of the following large groups;
    A. Angiosperms
    B. Gymnosperms
    C. algaes
    D. ferns
    E. mosses.

17. Which of these describes a rainforest plant that grows on the limb of a tree, using the tree only for support:
    A. emergent
    B. strangler
    C. epiphyte
    D. parasite
    E. gap species

18. Fungi that cover the root tips of most rainforest trees and plants, and help them take in nutrients that would have been washed away by heavy rainfall, are called:
    A. drip tips
    B. gap species

C. emergents
D. epiphytes
E. micorrhiza

Now on the blank backside of your Scan-tron answer sheet, answer the following short essay question:

How are all living things "classified" and why are they classified this way?

GENERAL EDUCATION ASSESSMENT REPORT

BIOL105/105L Attributes of Living Systems
(Gen Ed Course - Department, Number, Title of Course)

2009-2010 (Assessment Period Covered)

April 17, 2009 (Date Submitted)

Submitted By: Kyle McQuade, Assistant Professor of Biology

General Education Objectives addressed by this course:
(List a minimum of two)

1. Have knowledge of the natural world and an understanding of scientific methods

2. Understand the structure and discipline of mathematical thought and its use in problem-solving

(Please Copy and Paste to create space for additional GE Objectives, if necessary)

General Education Objective #1:

First Means of Assessment for GE Objective #1:

1a. First Means of Assessment and Criteria for Success:
During the first week of BIOL105 (lecture), instructors administered an exam covering the core elements of biochemistry, cell biology and genetics. Performance on these pre-tests was compared to scores on the same questions that were either integrated into a cumulative final exam or asked separately as a post-test. We expected that performance would improve for virtually all students. We also expect that the average score on these questions would be at least 70% by the end of semester. A partial list of potential test questions is attached.

1a. Summary of Assessment Data Collected:

McCallister
Fall 09 - average score on pre-test = 48%, average score on final test = 68%
Spring 2010 - average score on pre-test = 49%, average score on final test =70%
Virtually all students who finished the class improved

McQuade
Fall 09 - average score on pre-test = 52%, average score on final test = 87%

1a. Use of Results to Improve Gen Ed Course:
Results of this assessment were very near our expected outcomes. We plan to continue to use pre/post tests to monitor teaching effectiveness.

Second Means of Assessment for GE Objective #1:

1b. Second Means of Assessment and Criteria for Success: As part of the BIOL105 post-test or final exam, students were asked to write a short essay on an experiment that has influenced our understanding of biology. Students were asked to describe both experimental design and the impact of that experiment. We expected that 70% of students will be able to accurately describe an important experiment by the end of the course.

1b. Summary of Assessment Data Collected:
McQuade – Fall 09 – 30 of 43 students taking the final exam earned at least 7 of 10 points on a final exam question requiring students to accurately describe and discuss an important experiment in biology

1b. Use of Results to Improve Gen Ed Course: we plan to continue to emphasize the investigative nature of science in future sections of this course

General Education Objective #2:

First Means of Assessment for GE Objective #2

2a. First Means of Assessment and Criteria for Success: We planned to administer a survey measuring student knowledge of basic statistics during the first week of the lab. Scores on these pre-tests were to be compared to performance on the same questions asked separately in a post-test. Unfortunately, we forgot to do this assessment. We plan to do this in upcoming course sections. Several sections are taught each semester.

2a. Summary of Assessment Data Collected:

2a. Use of Results to Improve Gen Ed Course:

Second Means of Assessment for GE Objective #2

2b. Second Means of Assessment and Criteria for Success:

2b. Summary of Assessment Data Collected:

2b. Use of Results to Improve Gen Ed Course:

(Please Copy and Paste to create pages for additional GE Objectives, if necessary)

Please attach copies of multiple choice questions used or rubrics used for scoring papers or essays.

BIOL105 assessment sample questions:

1) Atoms are made of
    a. Protons
    b. Neutrons
    c. Electrons
    d. None of the above
    e. All of the above
2) Covalent bonds are chemical interactions in which _____ are shared between atoms
    a. Protons
    b. Neutrons
    c. Electrons
    d. None of the above
    e. All of the above
3) Enzymes are:
    a. Proteins that catalyze chemical reactions
    b. Nucleic acids that possess genetic information
    c. Lipids that are used for energy storage
    d. All of the above
    e. None of the above
4) In eukaryotic cells, photosynthesis occurs in the:
    a. Mitochondria
    b. Chloroplasts
    c. Lysosomes
    d. Nucleus
5) An energy rich compound that is used to drive many biochemical reactions is:
    a. ADP
    b. NAD^+
    c. ATP
6) Most proteins that are secreted from cells are synthesized by ribosomes that:
    a. Are attached to the endoplasmic reticulum
    b. Are found in the cytoplasm
    c. Are located in mitochondria
    d. Are attached to the plasma membrane
7) Plasma membranes are:
    a. Made of lipids
    b. Fluid in nature
    c. Barriers to diffusion to some, but not all molecules
    d. All of the above
    e. None of the above

8) Translation is:
    a. The process of making protein from an mRNA template
    b. Catalyzed by ribosomes
    c. Occurs in the nucleus
    d. A and B
    e. A, B and C
9) A diploid organism that has two different alleles for a specific gene is
    a. Haploid
    b. Homozygous
    c. Heterozygous
    d. None of the above
10) A cell that undergoes mitosis and cytokinesis produces daughter cells that
    a. Have half the number of chromosomes as the original cell
    b. Are identical genetically to one another
    c. Are identical genetically to the parent
    d. None of the above
    e. A and C
    f. B and C

Appendix G

NSTA SPA Evaluation

NATIONAL RECOGNITION REPORT
Initial Preparation of Science Teachers (2004 Standards)

NCATE recognition of this program is dependent on the review of the program by representatives of the National Science Teachers Association.

COVER PAGE

Name of Institution

Colorado Mesa University

Date of Review

MM DD YYYY

08 / 01 / 2012

This report is in response to a(n):

- ○ Initial Review
- ○ Revised Report
- ◉ Response to Conditions Report

Program Covered by this Review

Science Education: Single-Field

Grade Level(1)

7–12

(1) e.g. Early Childhood; Elementary K-6

Program Type

First Teaching License

Award or Degree Level

- ◉ Baccalaureate
- ○ Post Baccalaureate
- ○ Master's

PART A - RECOGNITION DECISION

SPA Decision on NCATE Recognition of the Program(s):

- ○ Nationally recognized

- ○ Nationally recognized with conditions
- ◉ Further development required **OR** Nationally recognized with probation **OR** Not nationally recognized [See Part G]

Test Results (from information supplied in Assessment #1, if applicable)

The program meets or exceeds an 80% pass rate on state licensure exams:

- ◉ Yes
- ○ No
- ○ Not applicable
- ○ Not able to determine

Comments, if neeessary, concerning Test Results:

100% Praxis Score
Content Analysis form is included, and the program has plans to add as well as design and include new content courses to align the content knowledge with SPA/NSTA National Science Education Standards.

Summary of Strengths:

The proposed changes in the content and pedagogy courses to align with the NSTA standards should yield good data. Plans are for data from the revised assessments to be collected as early as this fall.

PART B - STATUS OF MEETING SPA STANDARDS

Standard 1. Content. Teachers of science understand and can articulate the knowledge and practices of contemporary science. They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations. To show that they are prepared in content, teachers of science must demonstrate that they:

(a) understand and can successfully convey to students the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association;
(b) understand and can successfully convey to students the unifying concepts of science delineated by the National Science Education Standards;
(c) understand and can successfully convey to students important personal and technological applications of science in their fields of licensure;
(d) understand research and can successfully design, conduct, report and evaluate investigations in science;
(e) understand and can successfully use mathematics to process and report data, and solve problems, in their field(s) of licensure.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Standard 1 is met. Evidence provided adequately addresses the important defining elements of the standard.

Standard 2. Nature of Science. Teachers of science engage students effectively in studies of the

history, philosophy, and practice of science. They enable students to distinguish science from nonscience, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science. To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:

(a) understand the historical and cultural development of science and the evolution of knowledge in their discipline;
(b) understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world;
(c) engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science.

Met	Met with Conditions	Not Met
○	◉	○

Comment:

Standard 2 is met with conditions.
Some assessments are either not properly aligned with or do not provide adequate evidence for completely meeting this standard.
Evidence provided does not address candidates' ability to develop lesson plans for the teaching of the Nature of Science, which enables students to distinguish science from nonscience, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science. This is generally Assessment 3 (NSTA 2003 2c).
Evidence provided does not address candidates' effects on students' knowledge of the Nature of Science, which enables students to distinguish science from nonscience, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science (NSTA 2003 2c). This is generally Assessment 5.

Standard 3. Inquiry. Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences. To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

(a) understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge;
(b) engage students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Standard 3 is met. Planning Assessment and Effects on Student Learning Assessment are aligned with and provide adequate evidence for meeting this standard.

Standard 4. Issues. Teachers of science recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology-related issues of interest to the general society. They require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values. To show that they are prepared

to engage students in studies of issues related to science, teachers of science must demonstrate that they:

(a) understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues;
(b) engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students.

Met	Met with Conditions	Not Met
○	○	◉

Comment:

Standard 4 is not met. The assessments used to provide evidence for this standard are not science specific; therefore, they cannot address candidates' knowledge and ability to understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues and engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions, and relating these to the knowledge, goals, and values of the students.
Assessment 3 is not science specific and does not address the candidates' ability to develop lesson plans that address this standard, 4b.
Assessment 5 does not demonstrate candidates' ability to engage students successfully in the analysis of problems and relating these to the knowledge, goals, and values of the students. The Impact on Student Learning assignment is a generic instrument and does not assess candidates' impact on students' understanding of Issues in Science.

Standard 5. General Skills of Teaching. Teachers of science create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They use, and can justify, a variety of classroom arrangements, groupings, actions, strategies, and methodologies. To show that they are prepared to create a community of diverse learners, teachers of science must demonstrate that they:

(a) vary their teaching actions, strategies, and methods to promote the development of multiple student skills and levels of understanding;
(b) successfully promote the learning of science by students with different abilities, needs, interests, and backgrounds;
(c) successfully organize and engage students in collaborative learning using different student group learning strategies;
(d) successfully use technological tools, including but not limited to computer technology, to access resources, collect and process data, and facilitate the learning of science;
(e) understand and build effectively upon the prior beliefs, knowledge, experiences, and interests of students;
(f) create and maintain a psychologically and socially safe and supportive learning environment.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Previously met.

Standard 6. Curriculum. Teachers of science plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the National Science Education

Standards. They begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching. To show that they are prepared to plan and implement an effective science curriculum, teachers of science must demonstrate that they:

(a) understand the curricular recommendations of the National Science Education Standards, and can identify, access, and/or create resources and activities for science education that are consistent with the standards;
(b) plan and implement internally consistent units of study that address the diverse goals of the National Science Education Standards and the needs and abilities of students.

Met	Met with Conditions	Not Met
(•)	( )	( )

Comment:

Previously met.

Standard 7. Science in the Community. Teachers of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science-related studies or activities related to locally important issues. To show that they are prepared to relate science to the community, teachers of science must demonstrate that they:

(a) identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science;
(b) involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community.

Met	Met with Conditions	Not Met
( )	( )	(•)

Comment:

Standard 7 is not met. The assessments used to provide evidence for this standard are not science specific; therefore, they cannot address candidates' knowledge and ability to identify ways to relate science to the community, involve stakeholders and use the resources to promote the learning of science, or involve students successfully in related activities.
Assessment 3 does not clearly address the science-specific goals or substance of standard 7b.

Standard 8. Assessment. Teachers of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment. To show that they are prepared to use assessment effectively, teachers of science must demonstrate that they:

(a) use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students;
(b) use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process;
(c) use the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Previously met.

Standard 9. Safety and Welfare. Teachers of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field. To show that they are prepared, teachers of science must demonstrate that they:

(a) understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials.
(b) know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction;
(c) know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students;
(d) treat all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use.

Met	Met with Conditions	Not Met
○	○	◉

Comment:

Standard 9 is not met. There is no convincing evidence that all elements of the standard have been addressed. The Student Teaching Observation Form is required to clearly address all components of NSTA 2003 9: 9a, 9b, 9c, 9d. Criteria should be defined in operational terms. Minimum levels of performance are needed.

Standard 10. Professional Growth. Teachers of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment. To show their disposition for growth, teachers of science must demonstrate that they:

(a) Engage actively and continuously in opportunities for professional learning and leadership that reach beyond minimum job requirements;
(b) reflect constantly upon their teaching and identify ways and means through which they may grow professionally;
(c) use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth;
(d) interact effectively with colleagues, parents, and students; mentor new colleagues; and foster positive relationships with the community.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Previously met.

PART C - EVALUATION OF PROGRAM REPORT EVIDENCE

C.1. Candidates' knowledge of content

Assessments 1 and 2 provide sufficient evidence that candidates understand the content in their subject area(s).

C.2. Candidates' ability to understand and apply pedagogical and professional content knowledge, skills, and dispositions

Because of the generic nature of assessments in this area, evidence is weak or insufficient that candidates have the professional and pedagogical knowledge and skills specific to science as reflected by the NSTA standards.

C.3. Candidate effects on P-12 student learning

Evidence provided did not demonstrate that the program's candidates are positively affecting P–12 student learning in the areas of science content, nature of science, inquiry, and issues in science.

PART D - EVALUATION OF THE USE OF ASSESSMENT RESULTS

Evidence that assessment results are evaluated and applied to the improvement of candidate performance and strengthening of the program (as discussed in Section V of the program report)

This report provided improved rubrics to address alignment with NSTA 2003. Data were not available to be used for improvement for most assessments.

PART E - AREAS FOR CONSIDERATION

Areas for consideration

Assessments 3 and 5 evidence, criteria, and rubrics do not address candidates' ability to develop lesson plans for NSTA Standards 2, 4, and 7. Criteria and rubrics should be science specific and focus on elements of the standard. Data should be disaggregated by element.
Standard 9 is not met with Assessment 4. There is no convincing evidence that all elements of the standard have been addressed. The Student Teaching Observation Form is required to clearly address all components of NSTA 2003 9: 9a, 9b, 9c, 9d. Criteria should be defined in operational terms. Minimum levels of performance are needed.

PART F - ADDITIONAL COMMENTS

F.1. Comments on Section I (Context) and other topics not covered in Parts B-E:

To be nationally recognized with conditions, the program must meet both safety assessments (Student Teaching Observation Form and a separate Safety Assessment).

F.2. Concerns for possible follow-up by the Board of Examiners:

PART G -DECISIONS

Please select final decision:

- **Program does not currently satisfy SPA requirements for national recognition**. See below for details.

PROGRAM DOES NOT MEET SPA REQUIREMENTS FOR NATIONAL RECOGNITION

Terms and Subsequent Actions

- **Not Nationally Recognized** The program has failed to meet SPA requirements for national recognition, or conditions to national recognition, according to the expectations or time period specified in previous national recognition report(s). The institution may submit a new, complete program report and initiate a new program review. In states that require NCATE program review, another program report must be submitted before the next NCATE accreditation visit. If currently listed, the program will be removed from the list of recognized programs on the NCATE website. Although the program's status will not be posted publically, the current status of Not Nationally Recognized will be included in the BOE report and communicated to the appropriate state entity.

Comment on decision:

The possible dates for submission of a Revised Report have passed.

Please click "Next"

This is the end of the report. Please click "Next" to proceed.

Department Review
Biological Sciences
Colorado Mesa University
Grand Junction, CO

Site Visit – 14 March 2014

Brian I. Crother, Ph.D.
Professor of Biology and
Assistant Dean
College of Science and Technology
Southeastern Louisiana University
Hammond, LA 70402

Executive Summary – Table

Program Review Element	Check the appropriate selection				Provide explanation if not agree with element and/or why unable to evaluate
	Agree	Not Agree	Unable to Evaluate	Not Applicable	
The program's self-study is a realistic and accurate appraisal of the program.	X				
The program's mission and its contributions are consistent with the institution's role and mission and its strategic goals.	X				
The program's goals are being met.	X				
The curriculum is appropriate to the breadth, depth, and level of the discipline.		X			Cannot cover the discipline with too few faculty (see Curriculum below)
The curriculum is current, follows best practices, and/or adheres to the professional standards of the discipline.		X			Should organic chemistry and/or biochemistry be added to the Biology curriculum? (see Curriculum below)
Student demand/enrollment is at an expected level in the context of the institution and program's role and mission.		X			The increase in enrollment and demand is higher than expected for the number of faculty
The program's teaching-learning environment fosters success of the program's students.	X				
Program faculty members are appropriately credentialed.	X				
Program faculty members actively contribute to scholarship, service and advising.	X				
Campus facilities meet the program's needs.	X				

Equipment meets the program's needs.	X				
Instructional technology meets the program's needs.	X				
Current library resources meet the program's needs.	X				
Student learning outcomes are appropriate to the discipline, clearly stated, measurable, and assessed.		X			Assessment remains a work in progress for the Department (see Assessment below)
Program faculty members are involved in on-going assessment efforts.	X				
Program faculty members analyze student learning outcome data and program effectiveness to foster continuous improvement.		X			They are working on that. (see Assessment below)
The program's articulation of its strengths and challenges is accurate/ appropriate and integral to its future planning.	X				

Executive Summary – Narrative

The general health of the Department is good, but with increased enrollment and concomitant increased responsibilities, the current positive feelings may be short lived if more faculty are not hired. The facilities are fine. The Department Head is respected. The faculty is collegial. Assessment is in the developmental stages and the curriculum requires revisions. Students think highly of the program and the faculty and find them extremely caring and attentive, but wish course scheduling conflicts would be reduced. Undergraduate research is excellent but reassigned time for mentors needs to reevaluated. The library, distance learning, and IT support services are all excellent with regard to the Department. If the Department has any vision, it is to improve on the status quo, continue doing what they are doing, but only better.

Recommendations

The highest priority is to increase the number of faculty in the Department, both in tenure track lines and full time instructors.

The second highest priority is to manage the increased faculty numbers so those with research programs or high service obligations (e.g. Early Scholar coordinator) have appropriate teaching loads and reassigned time.

The most exemplary aspect of the program is the available undergraduate research opportunities and this is only because of an eager, creative, and exceptional faculty: keep and expand.

The most important improvements this program needs to make during this next review cycle, within the context of limited resource availability is to (1) take the Teacher Education program seriously and get it nationally recognized and (2) make a number of curriculum oriented changes as described below.

General Health of Program

The Department has excellent, hard working, collegial faculty that create a welcome and caring learning environment for students. Students roundly praise the faculty and program. The number of majors is at an all time high. Undergraduate research is excellent. However, the current excellent health of the program may degrade rapidly if help is not given to the Department in terms of additional faculty, full time instructors, and reduced teaching loads. The Department has been asked to carry a heavy load in the face of rapid enrollment increases and they have responded, but I think the proverbial straw that broke the camel's back is not too far away.

Physical Assets

The physical resources and equipment for the Department as described in the self-review (I won't repeat them here) are exceptional and more than adequate. The smart teaching classrooms are outstanding and the increase in shared research space for undergraduates is a plus. However, if the University continues to grow, the number of Biology majors increases, and the Department faculty increase, space will become an issue. If the Department embarks on expanding its teaching and research programs, the current amount and type of space will become inadequate. With regard to vehicles, some faculty noted they wish the Department had its own vehicles instead of using the University fleet. Convenience and time were the main reasons why the Department needs its own vehicles.

Financial Resources

Some institutional monies are available for travel, supplies, and equipment but they are minimal if they are to support the scholarly activities (research, meeting attendance, publication costs) of the faculty. These kinds of funds are appropriate for providing undergraduate research opportunities, and could be enhanced to expand such programs. These funds are also appropriate to fund meeting travel and publication costs, but individual research largely should be funded by the researcher. Writing external grants should be promoted, but faculty will need time to write proposals. That is another reason to reduce the teaching load for those engaged in research and publishing.

Morale

The morale of the Department faculty is fairly good but on the edge of negative change. The work load is heavy with teaching responsibilities, advising, and undergraduate research (I am not factoring in committee work, but I am sure that too adds to the burden). The reassigned time for undergraduate research is honestly ridiculous. Faculty engaged in serious (not dabbling) undergraduate research should have a teaching load of nine hours, maximum. The coordinator of the Early Scholar program should have a teaching load of nine hours, but preferably six hours. To achieve these and other necessary changes, the Department must expand its tenure track faculty. There are excellent and energetic faculty in place, so the addition of more such faculty coupled with the reduction of teaching load would allow the Department to expand and enhance its undergraduate research program, which from conversations with students and faculty is clearly one of, if not the, crown jewel of the Department. An expansion of the faculty would also increase the quality of the advising. Another thought with regard to the high teaching concerns new faculty. If the teaching loads remain high, it would be a direct benefit to give some respite to the new faculty for the first one or two semesters so they can get their feet on the ground, have more time to develop courses, and possibly even get started on undergraduate research. I was stunned to hear that one professor developed 11 new course preps over his first three years and that it is not uncommon to have four or five different preps per semester.

The process for hiring part-time faculty is an issue. The faculty do not believe they are getting quality instructors. It seems the faculty have no say in the matter because the decision to hire is often too late to involve them. Sometimes circumstances force a last minute decision by the DH, but where possible the faculty should be involved in the process.

Annual evaluations appear to be a problem. The faculty feel there is an overemphasis on student evaluations. While the faculty recognize the mission of the University and the importance of teaching, they feel using the *average* of student evaluations biases/skews the values. The faculty recommend the evaluations use the *median* instead, to more appropriately describe what most of the students thought about the professor's teaching. I concur with this and recommend the change.

Assessment

The Department is working on making their assessment process credible and continuous. From what I saw and heard from the faculty and assessment representative, they are still in the early stages of development. They are not there yet, but it seems that most members of the Department have bought into the importance of assessment. The courses being assessed make sense. It will be interesting to see where the Department is with regard to assessment in five years.

Curriculum

Course Offerings

The course offerings do not reflect the diversity of courses listed in the catalog and frankly I don't see how it could with so few faculty. The diversity of courses in the catalog is impressive, no doubt, but probably misleading to undergraduates hoping/expecting to take certain courses that may not have been offered in years. I understand the hesitation of culling courses (and I do not recommend it) not recently offered and it may be that the two year rotation schedule alleviates some of the angst by simply making students aware in advance of what will be offered. Even so, students said that the two year rotation is not always what eventually gets offered. Frequently, unique course offerings occur under the guise of Topics. While it is an advantage to students to

offer such courses, I am not sure if it is in the Department's best interest when the Department can't seem to offer the courses already on the books or even teach all the courses promised in the two year rotation. From a student perspective, they see scheduling courses as the biggest problem. There are too many required courses that overlap in scheduled offerings. This should be fairly easy to remedy but requires the leadership of the DH.

Sequence of Courses

The development of a two year rotation and sequence of courses in the Department is a terrific aid to the students, if the promised courses are actually offered and taught. Student progression in a timely fashion is often dependent upon good advising, which as noted in the self-review is an enormous load and was admitted to be somewhat problematic. One way to control students taking courses in a logical sequence (like that recommended in the Program Sheet) is through prerequisites. I was a bit surprised that in many cases prerequisites are not required for a fair number of upper division courses. I understand a prerequisite check was conducted recently, but some courses apparently slipped through the cracks. If there is a problem getting students to finish the four introductory courses prior to taking fundamental courses (e.g. genetics and cell) and then advanced courses such as evolution, molecular biology, ecology, etc., perhaps making all four introductory courses the prerequisites for all more advanced courses will stop that problem. Genetics as a core course is offered only once a semester and has been a continuous bottleneck for student progression. I recommend offering two sections of genetics at least one semester every year, but two sections every semester would probably be best. Another option would be to offer such upper division core courses in the summer.

On the subject of a beginning foundational sequence of four introductory courses (BIOL 105, 106, 107, 208), this seems extreme. Also interesting is that no organic chemistry is required for the Biology major (except pre-meds), but I understand the hours problem because of the 120hr limit. A way to solve this is to trim the introductory biology courses to two, a cell-molecular-genetics course and an ecology-evolution-diversity course. Zoology and botany can be taken later. Removing two introductory lectures/labs opens space to insert two semesters of organic chemistry, or for those that

don't require two semesters there can be a survey of organic and a survey of biochemistry series developed for the other majors that don't need one year of organic chemistry.

Concentrations

The idea to break out concentrations of study under Biology is excellent and should be completed. The four suggested concentrations make sense although it is easy to see how courses would crossover the concentrations. The main problem with offering a cell-molecular concentration is the lack of faculty with expertise in that area. With only two faculty, they cannot possibly be expected to cover all the courses offered in the concentration. Additional faculty are required to add the cell-molecular concentration. I am not sure Development makes sense as part of an overarching concentration, given its importance in organismal and evolutionary studies. I would also recommend changing the concentration name "General Biology" to "Integrative Biology" to reflect the nature of the concentration and remove the unfortunate stigma associated with the descriptor "General."

The changes recommended under Concentrations and Sequence of Courses are not minor, will require curriculum changes, and should be addressed.

Teaching Concentration

The enrollment of this concentration has remained steady over the years and provides an important service to the region. By all means this program should be retained in Biology. However, based on the SPA decision on NCATE recognition (i.e. not nationally recognized) of the program, work is required to bring the program up to speed. Troubling to me was that the standards not met had to do with community and society related extensions of the science teachers. Science as a way of knowing is under attack in this country so it is imperative that our science teachers contribute to enhancing student attitudes about science. I think it would be a shame if this program was allowed to founder. The Department should be proud of this program, take ownership of it, and increase its quality. A faculty member should be assigned coordinator duties and receive reassigned time of said duties.

Advising

As noted above and in the self-review, advising is an issue. Adding concentrations and different degree paths will help students focus and will help keep students on track to

completion, but it is no guarantee. Mandatory advising prior to registration should be implemented. This will keep students on track and reduce the number of students falling through the cracks. Progression and retention will benefit from adding that practice. However, with only tenure track faculty involved in advising the workload increase would be massive. Giving advising responsibilities to full time instructors would help spread the workload, but the addition of tenure track faculty would be optimal.

Department Head

The opinions about the Department Head (DH) are variable, but in general positive. For sure, with the removal of Deans the workload on the DH is extra large, especially with a nine-month contract. The DH should be on a 12-month, given the responsibilities do not simply go away over the summer. Yes, there is a summer stipend to cover times the DH must come in but in my opinion this does not suffice. The Department would be better managed with a 12-month position. The faculty appeared fairly satisfied with the general disbursement of funds for travel, supplies, and equipment given the amounts available (although the faculty noted that more is always better). They think the DH is creative and tries to help whenever and however she can.

Students

Satisfied?

Based on survey results mentioned in the self-review, even though the sample size was small, most of the students were generally satisfied with their education in the Biology Department. From speaking to several students during my visit, it is apparent they LOVE the faculty. They feel the faculty genuinely care about them and are attentive to their needs, problems, and questions. Some results from the exit surveys in the self-review illuminated some of the issues facing the Department and to me they all reflect on the size of the faculty; there are too few. For example, students would like more course offerings (the list of courses in the catalog is impressive, but with so few faculty it is easy to understand why the diversity of courses cannot be offered), increased undergraduate research experience, and the addition of specific discipline concentrations and not just general biology. Also illuminating was what students felt they did not learn in the

Biology program, specifically and especially an understanding of philosophical issues. The new Nature and Philosophy of Science course should help remedy this deficiency and serious thought should be given to making the course required.

Faculty-Student Ratio

Based on the self-review numbers, there are 16 full-time (12 tenured/tenure track, four instruetors; I am including the faculty in transition to retirement) faeulty and about 470 majors. For institutions of comparable mission and size this is a high ratio of about 29 students/faculty. It is easy to understand the advising load burden because the instructors do not advise. When all biology course enrollees are figured the faculty to student ratio skyrockets, creating large classroom sizes and a high teaching load. Neither of these is conducive to creating a positive learning environment. The remedy, of course, is to increase the size of the Department's tenure traek faculty and add full time instructors.

Retention

Comparing 2011 with 2012 retention rates, the department appears to be headed in the right direction. Only juniors dropped off a bit. Often retention is related to how much involvement the department has with the students not only during advising (which should be mandatory for registration) but also during the semester. I understand mid-term grades are reported offieially for at risk students who are subsequently contacted. This is a good policy to have in place, but the data must be used to target any student that requires intervention by the advisor or the professor of the course in which the student is struggling.

Undergraduate Research

With few research oriented faculty in the Department, the undergraduate research accomplishments are fairly impressive. However, it is clear that more undergraduates would like research opportunities. Also impressive is the percentage of undergraduate researchers that said they plan to pursue post-graduate education. That may be the best reason to expand research opportunities in the Department. As mentioned previously, to increase undergraduate research opportunities, time must be made available to the

faculty. The reassigned time formula for mentoring undergraduate research must be changed to bring the teaching load down to a real nine-hour load, at maximum.

Library

The relationship between the Department and the Library is excellent. The library is quick to act and is proactive in helping decide on additions to its holdings with regard to new courses and faculty interests. Desk-top delivery of research articles is quick and efficient, for both faculty and students.

IT and Distance Learning

Both of these support services to academics work excellently with the Department. The technology available for teaching is terrific and site licenses for research oriented software packages are in place. The Distance Learning platform (D2L) is easy to use and praised by the faculty. I found the site easy to navigate. The support staff of the Distance learning programs may need to be expanded to keep up with the increasing number of faculty who decide to teach online courses.

Direction of Department

This was an interesting topic of discussion to me. Essentially, there was no real vision of change for the future. The majority of the faculty feel the direction the Department should take is to expand their tenure track lines and reduce the teaching loads to improve the quality and availability of undergraduate research opportunities. Basically, just keep doing what they are doing but just doing it better. Increasing in-house monies for undergraduate research was also a priority for the future.

The addition of an MS Program was favored by a minority, but in general most felt the resources (faculty, time, TA stipends) were not in place to properly run an MS program. Twelve tenure track faculty are too few to have a critical mass for MS level research programs. Multiple faculty in related areas are necessary to develop overlapping research programs to have enough graduate students to take graduate courses. The current diverse faculty are great for teaching a diversity of courses, but to develop graduate research programs there needs to be faculty with similar research interests. For example,

if there is only one molecular geneticist, who will take his graduate course offerings and what courses will his graduate students take? The Department probably needs a minimum of 16 tenure track faculty to get the graduate program rolling properly. One of the concerns some faculty have regarding an MS program is that it would create divisions in the Department, separating faculty into graduate faculty and those not. True, but is that a bad thing? If a faculty member is conducting research and mentoring graduate students should she/he not be recognized for that work? Every department with graduate programs deals with that issue. There should be reduced teaching loads for graduate faculty and graduate faculty should be encouraged to obtain external funds from state and federal agencies and not depend on the largesse of the Department and University. One thing that stands out and makes an MS program more than just a good idea is the geographic location. There does not appear to be any such program anywhere close, a situation the University and Department could and probably should take advantage of. With no competition and lots of local federal and state agencies to work with, I suspect an MS program in organismal, ecology, and evolutionary biology would flourish, given the proper institutional support.

Positives

In summary undergraduate research, diversity of courses in the catalog, location of university, increased admissions as biology majors, core of eager and active faculty, addition of concentrations in the curriculum, development of two year schedules of courses, development of assessment, library support, distance learning support, IT support, and facilities are all positive aspects of the Department.

Negatives

The primary concern is the number of tenure/tenure track faculty. Increase in the tenure track faculty would enhance many aspects of an already hard working and arguably overburdened department. Time outside of teaching responsibilities is a close second and would be helped with more faculty to reduce teaching *and* advising loads. Reasonable (but not the current formula) reassigned time should be implemented. Undergraduate research opportunity is a negative because there are currently too few

research oriented faculty and with an eager and available student body this should be expanded as much as possible. Course scheduling to avoid conflicts of required biology courses is a must. The quality of part time instructors is an issue. Teaching concentration is not nationally recognized.