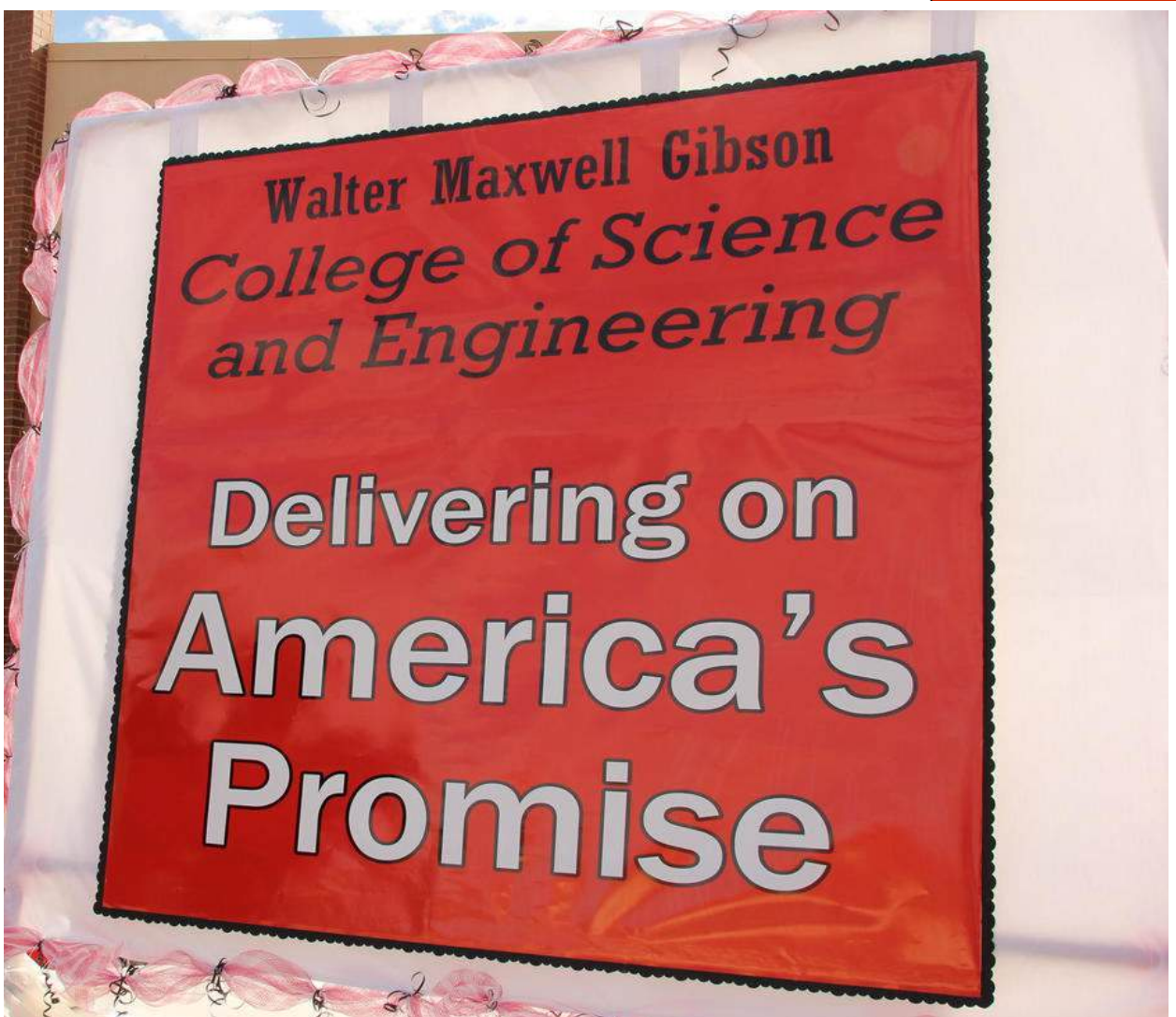


2014-
2015

Walter Maxwell Gibson
College of Science and Engineering
Annual Report



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EXECUTIVE SUMMARY 2014-2015

Summer 2015

This executive summary highlights some of the accomplishments, events, and productivity which indicate the level of competence and dedication of the faculty in the Walter Maxwell Gibson College of Science and Engineering (WMG COSE)

1. Three faculty from WMG COSE received significant honors this year. The Thunderbird Awards have been a campus tradition at Southern Utah University since 1950. Bill Heyborne, Assistant Professor of Biology, was named the Thunderbird Advisor of the year. John MacLean, Assistant Professor of Geology, was recognized as Thunderbird Professor of the Year. Dean Winward, Associate Professor of Agriculture, was deemed 2014 Cattleman of the Year by the Iron County Cattlemen's Association.
2. Our healthcare professional acceptance rate continues to surpass state and national norms. Data for the 2014-15 academic year shows that 100% of WMG COSE applicants were accepted to dental school; 87% of medical school applicants were successfully admitted with two students still on waiting lists. This success continues to be attributable to a dedicated faculty and student body and a working partnership between the southern Utah Area Health Education Center's (AHEC) Rural Health Scholars program, directed by Ms. Rita Osborn, and the WMG COSE. This partnership is serving the region very well, as attested to by our outstanding success in placing students in graduate healthcare programs.
3. SUU Nursing student's pass-rate on the national standardized licensure exam (NCLEX-RN) was at least 39/42≈93% for this academic year which compares favorably with the national rate. The success of our students is a great tribute to the patience and determination of our nursing faculty and leadership.
4. The Voyager project, which is directed by Professor Peggy Wittwer (Beverly Taylor Sorenson College of Education and Human Development), continues to reach out to public education in the region. Peggy is assisted by WMG COSE Professors Bill Heyborne and Mackay Steffensen. *Voyager* is a state of the art mobile laboratory loaded with teaching technology and able to deliver it to remote locations. Check out our website: <http://suu.edu/cose/voyager/>.
5. The education partnership between SUU and SUCCESS Academy completed the 10th year of operation. Thirty seven students received their Associate of Science degree. This represents 2,947 credits from concurrent enrollment. Significantly, there continues to be more female students who choose to participate in this innovative STEM program. SUCCESS Academy, in partnership with the Iron County School District and SUU, continues to have a lottery based on the number applications that we receive. SUCCESS Academy continues to support high school students participation in on-campus courses with over \$100,000 dollars of tuition paid to Southern Utah University. Students received top honors in the Chemistry Olympics. SUCCESS seniors have an average ACT composite score of 25. When surveying students, over 80 percent choose SUU as their undergraduate degree institution. Continued partnerships are being developed in computer science and engineering with increased emphasis and resources being focused upon students successfully mapping a four year pathway toward the completion of their Bachelor degree. This continues to be a successful collaboration and we thank Principal John Tripp and his staff for the opportunity to continue the partnership. Additional information can be found at: <http://successacademyonline.com/>.
6. The Cedar Mountain Science Camp (CMSC) continues to serve the region. Under the direction of Peggy Wittwer, Assistant Professor of Elementary Education, this joint program between the Beverly Taylor Sorenson College of Education and Human Development and the WMG COSE has provided high-quality outdoor education to 44,696 campers in the last sixteen years. This summer Professor Wittwer and her staff conducted twelve separate camp sessions and served 441 elementary students from 69 different regional towns, with 136 others turned away for lack of space. Additionally, the 5th annual *Camp Extreme* engaged 44 students with rock climbing, rappelling, whitewater rafting and other skills. More information is available at: <http://suu.edu/cose/center/>.

7. The Center for Applied Research and Advanced Technology (CARAT) is established to facilitate communication and collaboration between WMG COSE and commercial enterprises. Such interaction includes technical assistance, placement of student interns, promoting student employment, and dissemination of current developments in science, engineering, and technology. This latter aim is partially achieved by monthly CARAT seminars open to the public. See <http://suu.edu/cose/seminar.html>
8. The College was successful in obtaining numerous grants. The largest interdisciplinary grants include:
- WMG COSE continued a National Science Foundation *S-STEM* award of \$116,000/year for the years 2012-2016 to further enhance the preparation of Science, Technology, Engineering, and Math Educators at SUU. Kudos to Principal Investigator Jana R. Lunt and her team consisting of Bruce R. Howard, Matthew Roberts, John S. MacLean and Fredric R. Govedich. There were six new *S-STEM* scholarships awarded in 2014-2015 along with 14 continuations from 2013-2014.
 - Through the efforts of Bill Heyborne, *et al*, the *Utah STEM Center* awarded SUU \$280,000 for a 2015 grant entitled “Elementary STEM Partnership-Unleashing Curiosity”.
 - The *Utah Cluster Acceleration Partnership* awarded SUU (Principal Investigator Richard Cozzens) \$155,089 for Computer Science, Technology, and Engineering curriculum revision and enhancement in 2015-2016.
 - More external grants are listed in the department summaries of this report.
9. The *Sixth Annual WMG COSE Undergraduate Research Symposium* was held on November 17, 2014 in the Hunter Conference Center. The keynote speaker was Robert Gardner, software engineer from Google (see photo on the back cover of this report). There were 31 poster and 26 oral presentations at this year's meeting. The abstracts and some photos are available for examination at: <http://suu.edu/cose/symposium/>.
10. WMG COSE offered numerous high school outreach events during 2014-15, incorporating student contests, prizes, and special guests.
- Engineering Week at SUU (<http://suu.edu/cose/ie/engineeringweek/>)
 - Southern region of the Utah State Math Contest (<http://www.suu.edu/faculty/armstrong/mathcontest.php>)
 - Southern Utah Science and Engineering Fair (<http://suu.edu/cose/fair/>)
 - 12th Annual Chemical Olympics (<http://suu.edu/faculty/samha/chemolympics/>)
 - Technology Fair (<http://suu.edu/cose/techfair/>)
 - Technology, Engineering, and Computer Science Summer Camp (<http://suu.edu/cose/summercamp.html>)
11. This has been another productive year for College faculty. For the 2014-2015 academic year, the following data were reported:
- Refereed Scholarly Publications – 21
 - Refereed Presentations at Professional Meetings – 52
 - Books and other documents authored – 10
 - Funded Grants – 12
 - Special Recognitions and Awards – 3
12. Beginning 1 July 2015, three of our faculty were awarded promotions: Associate Professor Saïd Bahi was advanced to Full Professor, with Lecturers Mary Jo Tufte and Laurie Harris each promoted to Assistant Professor, Non-Tenure Track. We note the retirements or resignations of nine WMG COSE faculty/staff and acknowledge their efforts on behalf of the College: Elizabeth Bancroft, Roger Fischer, Gary Flandro, Ron Martin, Thad Morton, Heidi Schneider, Brent Sorenson, Paul Spruell, and Cindy Wright. Furthermore, Suzanne Tegland is reverting to adjunct status after a one year visiting position.

MESSAGE FROM THE DEAN



The Walter Maxwell Gibson College of Science and Engineering (WMG COSE) continues to accomplish significant things through the efforts of its faculty and students. I have uttered that statement so frequently, that I hesitate to reiterate it, however, you can see from this report that it continues to be true. Our graduates continue to gain acceptance to graduate healthcare programs at a very impressive rate. SUU Nursing graduates have a first attempt pass rate on their professional licensing examination (NCLEX-RN) that far exceeds the national average. Our faculty continues to engage students in undergraduate research projects that not only lead to professional presentation, but to significant numbers of peer-reviewed publications.

We were pleased to host Alice and David Gibson for a campus visit in April. Alice is Walter's widow, and David, former CEO of XOS Systems, is Walter's son. During their visit, we were able to show them how we are utilizing the resources that flow from the Gibson endowment. We also arranged meetings for the Gibson's with students, faculty, and staff. Their visit led to numerous discussions about streamlining, and in some cases altering, the process and distribution of the endowment funds. We so much appreciate this great family and their continuing support of SUU and the WMG COSE.

Dr. John Taylor, who accepted an administrative position as the SUU Provost's Faculty Fellow, vacated the directorship of the SUU STEM Center this past year, and Dr. William Heyborne, has been named as its new director. As part of his STEM Center duties, he also directed the SUU Science and Engineering Fair. He worked with our regional K-16 Educational Alliance Group, State Representative John Stanard, and State Senators Steven Urqhart and Evan Vickers to secure one-time legislative funding to support STEM education initiatives for Dixie State University and SUU in an amount that exceeds \$500,000. We express our thanks to our region's legislative team and commit to use these resources in ways that will "move the needle" toward increasing STEM graduates and literacy.

We were pleased to cut the ribbon on a new indoor riding arena to support our Equestrian Science Program this year. The Kenneth L. Cannon Equestrian Center officially opened with a ribbon-cutting ceremony on March 19th, 2015. Located at our west campus, the SUU Valley Farm, this 22,900-square-foot riding arena will serve an estimated 600 students each year, allowing classes to deal with inclement weather conditions in far more comfort and safety. This facility was made possible by the generosity of many friends of the University. We express thanks to Connie Holbrook and her family, and note that the facility bears the name of their father, Mr. Kenneth L. Cannon. We also express thanks to Garth and Jerri Frehner, EnergySolutions, the Shannon Family Foundation, Edward and Shirley Stokes, and numerous SUU faculty and staff members for their donations in support of the project. The facility was erected by Carter Construction Company and their attention to detail has made it exactly what we need it to be. Finally, we thank the Agriculture faculty and staff for their vision of this project and for their hard work in seeing it through to completion.

On a personal note, I turned 65 this summer. One might think that it is time for me to step down from this position, and pursue other interests (like more golf and more fishing). I would be untruthful if I suggested that the thought has never crossed my mind (my wife is already retired). However, working with my colleagues and the WMG COSE's students is the most satisfying work I could do. Don't look for me to step away voluntarily any time soon!

Sincerely,
Robert L. Eves

WALTER MAXWELL GIBSON COLLEGE OF SCIENCE AND ENGINEERING

MISSION AND GOALS

Mission

The Walter Maxwell Gibson College of Science and Engineering is made up of academic programs in agriculture, biology, chemistry, computer science, engineering and technology, geography, geology, information systems, mathematics, nursing, nutrition, and interdisciplinary studies. These programs are housed in the departments of Agriculture and Nutrition Science, Biology, Integrated Engineering, Mathematics, Nursing, Physical Science and the School of Computing and Technology. We operate or participate in the operation of several special learning environments for students that include an astronomical observatory, a GIS lab, a certified water lab, a scanning electron microscopy lab, the Garth & Jerri Frehner Natural History Museum, the Cedar Mountain Science Center, the Valley Farm, a Computer Forensic Lab, a Networking and Security Lab, the James E. Bowns Herbarium and the Mountain Ranch. We serve as the center of learning for the undergraduate STEM programs offered at SUU. We also serve as the resource center of scientific knowledge and expertise for southern Utah. The purpose of the Walter Maxwell Gibson College of Science and Engineering is to provide comprehensive classroom and experiential learning that emphasizes critical thinking, problem solving, decision-making, and communication in STEM. The faculty is committed to providing high-quality education, individual guidance and assistance to students, and helping them grow intellectually, professionally and personally while pursuing their academic goals.

Goals and Objectives

The observable, measurable goals of the Walter Maxwell Gibson College of Science & Engineering and the objectives by which they will be accomplished are:

1. GOAL: prepare students for graduate and professional schools.

OBJECTIVE: offer coursework and active learning experiences appropriate to the prerequisites of specified post-baccalaureate programs.

ASSESSMENT: tabulate student reportage on application/acceptance to post-baccalaureate programs.

For this academic year, we note the following:

- 87% acceptance to medical schools
- 100% acceptance to dental schools



2. GOAL: prepare students for careers using their baccalaureate degree.

OBJECTIVE: offer coursework appropriate for employment related to departmental majors or minors.

ASSESSMENT: require standardized, nationally-normed tests where appropriate and student reportage of employment at baccalaureate level. For 2014-15, the following were reported:

- Educational Testing Service (ETS) Major Field Exams
 - Chemistry—79th percentile student average
 - Biology—54th percentile student average
 - CS—78th percentile student average
 - Math—71st percentile student average
- American Chemical Society (ACS) end-of-course exams
 - Average for all Summer 2014 sections: 74th percentile
 - Average for all Fall 2014 sections: 68th percentile
 - Average for all Spring 2014 sections: 73rd percentile
- Geology ACAT exam—82nd percentile
- NCLEX national standardized nursing licensure exam
 - 100% pass rate for Fall 2014
 - At least 85% pass rate for Spring 2015

3. GOAL: develop skills in analysis, critical thinking, problem solving, decision-making and communication.

OBJECTIVE: offer well-planned and pedagogically sound learning exercises in courses and in research projects.

ASSESSMENT: annually examine and evaluate course syllabi, course materials, and student research experiences.

For 2014-15

- Each syllabus was examined at the department chair level.
- Student research experiences were evaluated during local presentation of the results, including the Festival of Excellence and 6th Annual WMG COSE Research Symposium.

4. GOAL: provide hands-on experiences with state-of-the-art scientific instruments and equipment

OBJECTIVE: provide coursework and research opportunities that include opportunities to use equipment.

ASSESSMENT: inventory current, and continuously update need for future, equipment.

For 2014-15

- The Kenneth L. Cannon Equestrian Center 22,900-square-foot riding arena opened March 19.

5. GOAL: provide highly skilled teachers and professors that are also respected scholars.

OBJECTIVE: recruiting Ph.D. - prepared faculty, reward good teaching, encourage faculty to conduct funded research and publish results, and encourage participation in professional organizations.

ASSESSMENT: annually evaluate faculty performances, teaching, scholarship, service, and collegiality using criteria and performance standards developed by departments and the college.

- All faculty members were formally evaluated by at least their chairs, peers, and/or the dean during 2014-15.
- All new faculty hires are highly qualified, with all tenure track faculty holding terminal degrees.

6. GOAL: provide special, unique learning opportunities.

OBJECTIVE A: utilize the Valley Farm, Mountain Ranch, Cedar Mountain Science Center, SUU's Ashcroft Observatory, Water Lab, the Garth & Jerri Frehner Natural History Museum, the GIS lab, and the molecular genetics and ecology labs.

ASSESSMENT: annually evaluate the use of our specialized learning environments.

- The Valley Farm (including the new riding arena) continues to support the SUU agriculture program.
- Cedar Mountain Science Camp served 441 students in twelve separate camps and continues to have more applicants than it can accommodate.
- The Ashcroft observatory is utilized as a teaching laboratory each semester and continues to hold community nights each Monday.
- The Water Lab continues to provide a community resource and employment and hands-on experience to SUU chemistry students.
- The Geographic Information Systems (GIS) lab is supporting coursework and completing contract work for local, state and federal agencies.
- The molecular genetics and ecology labs provide undergraduate research support

7. GOAL: maximize the utilization of our unique community and geographic resources

OBJECTIVE: foster and strengthen community and agency relationships.

ASSESSMENT: annually evaluate community and agency interaction.

- Faculty members from WMG COSE continue to serve on the cooperating association boards of Zion and Bryce Canyon national parks.
- WMG COSE continues to be a partner in the Intergovernmental Internship Cooperative (IIC) effort, which provides internship opportunities for SUU students with public land management agencies.

WALTER MAXWELL GIBSON COLLEGE OF SCIENCE AND ENGINEERING

DEPARTMENTS AND THEIR PROGRAMS

Department of Agriculture and Nutrition Science

Mission Statement

Agriculture Science

The mission of the agriculture program is to offer all students the opportunity to understand the discipline of agriculture as an applied science and a model for the principles of bioeconomics. The program is closely allied to the concept of service to the agricultural community. Recognizing the diversity of agriculture, faculty will articulate partnerships with colleagues and programs across the university campus. The agriculture program demonstrates teaching excellence by maintaining a faculty of well-educated and experienced agriculturalists. The agriculture program promotes a strong, hands-on, structured learning atmosphere and provides opportunities for independent inquiry and scholarship of application by students.

Human Nutrition

Recognizing the critical role of nutrition to all human endeavors, the mission of the nutrition program is to provide sound, science-based principles, theories and applications to students whose personal or professional interests embrace the discipline. The nutrition program at SUU prepares students for a number of related careers or entrance into a graduate program upon degree completion at SUU. Additionally, the program promotes wellness by offering a minor and support courses to compliment a variety of other disciplines, especially those related to health and human services and athletics. The program demonstrates dedication to outstanding teaching by maintaining a faculty of well educated, professionally qualified professor-practitioners.

Programs and Degrees Offered

BACHELOR DEGREES

BIS Agricultural Science & Industry (with emphases in Agribusiness, Animal Science & Industries, Plant Science & Industries, Natural Resources/Range Management and General Agriculture)

BS Human Nutrition/Allied Health

BS Human Nutrition/Pre-Dietetics

ASSOCIATE DEGREES

Agriculture: Livestock Farm Management

Agriculture: Equine Studies

MINORS

Agriculture

Human Nutrition

CERTIFICATES

Agriculture: Livestock Farm Management

Student Learning Outcomes

Agriculture Science

1. Students will demonstrate knowledge of scientific principles related to agriculture.
2. Students will demonstrate knowledge of agricultural industries including structure, production practices, and management principles.
3. Students will demonstrate effective application of agricultural knowledge and resources to solve problems and perform relevant activities.
4. Students will demonstrate effective communication appropriate to the discipline.

Human Nutrition

1. Students will demonstrate an understanding of nutrition, its language, history, findings, and applications.
2. Students will demonstrate effective and professional oral and written communication and use of current information technologies when communicating with individuals, groups, and the public.
3. Students will synthesize new knowledge from scientific literature; students will demonstrate their knowledge and understanding of the following:
 - a. the scientific method
 - b. reading, understanding, and critiquing peer-reviewed literature
4. Students will use appropriate tools to carry out investigations in nutrition courses.

Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Kirt M. Bussio	Professional Staff	Farm & Ranch Manager	1986
Nica Clark	Lecturer, Non-Tenure Track	Human Nutrition	2011
Chad L. Gasser	Associate Professor	Animal Science	2005
Artis P. Grady	Associate Professor	Human Nutrition	1990
Andrew Heaton	Professional Staff	Agriculture/Economics	2014
Matthew C. Schmidt	Associate Professor	Human Nutrition	2001
Randall D. Violet	Assistant Professor	Range Science	2012
Dean L. Winward	Associate Professor	Agriculture	1990
Lee G. Wood	Associate Professor	Animal Science	2000
Cynthia B. Wright	Professor, Chair	Human Nutrition	1981



Productivity Highlights 2014-15

Scholarly Presentations at Professional Meetings

Schmidt, M.C.; Grady, A.P.; Jolley, K.; Moore, R.; Vaughan, S. "Recipe development, consumer acceptability, usage and knowledge of resistant starch" *2014 Food & Nutrition Conference & Expo (FNCE) - Academy Of Nutrition And Dietetics*, October 20 2014, Atlanta GA

Schmidt, M.C.; Corser, G.; Gale, W.; Saucedo, M. "He is not fat, unhealthy, or lazy; he plays football" *2014 Food & Nutrition Conference & Expo (FNCE) - Academy Of Nutrition And Dietetics*, October 19 2014, Atlanta GA

Grady, A.P.; "What's new in nutrition: truth or trend?" *Utah Association of Family and Consumer Science Annual Conference*, November 8 2014, Salt Lake City UT

Burnside, A.; Conley, J.; Esplin, T.; Funk, M.; Kiesel, S.; Madill, S.; Margetts, K.; Nichols, K.; Palmer, T.; Pearce, L.; Stucker, J.; Grady, A.P.; Schmidt, M.C. "Hydration status of Division I football players during summer two-a-day training" *Utah Conference on Undergraduate Research*, February 27 2015, St. George UT

Gasser, C. L. "Understanding expected progeny differences", *7th Annual Cowman's Reproduction Workshop*, September 18 2014, Alton UT

Gasser, C. L. "Economics of artificial insemination and natural service" *7th Annual Cowman's Reproduction Workshop*, September 18 2014, Alton UT

Scholarly Articles

Kincheloe, J.J.; Wood, L.G.; Zobel, D.R.; Olson, K.C. "Influence of monensin fed with a starch-based energy supplement on forage digestibility and intake by range cows during drought" *The Professional Animal Scientist* 30 (4) 2014, 444—450

Professional Memberships and Community Service

Nica Clark

- Student service-learning coordinator for:
 - Canyon Creek Women's Crisis Center
 - Havenwood Academy
 - Iron County Share & Care
 - Iron County School District
 - Cedar City Senior Center
 - LDS Bishops Storehouse
 - Emerald Point Assisted Living Center
 - Paiute Tribe of Utah
- Member of:
 - Academy of Nutrition & Dietetics
 - Phi Kappa Phi Honor Society

Chad L. Gasser

- Editor or Reviewer for:
 - Journal of Animal Science
 - Animal Reproduction Science
 - NACTA Journal
- Member of:
 - American Society of Animal Science
- Judge or organizer for:
 - FFA events
 - Iron County Farm Field Day

Artis P. Grady

- Member of:
 - Academy of Nutrition & Dietetics
 - AAFCS/UAFCS
 - Delta Kappa Gamma
 - FPIND
 - Kappa Omicron Nu Honor Society
 - Phi Kappa Phi Honor Society
 - SCAN
- Nutrition consultant for *The Spectrum/Daily News*
- Member *Head Start* Health Advisory Committee
- Public school outreach

Matthew C. Schmidt

- Member of *Academy of Nutrition & Dietetics*
- Nutrition consultant for SUU athletic teams

Memberships & Service (continued)

Randall D. Violet

- Member of:
 - *Society for Range Management*
 - *NACTA*
 - *NAAE/UAAE*
 - *Western Society of Weed Science*
- Public school outreach

Dean L. Winward

- Member of:
 - *Iron County Cattleman's Assoc*
 - *Iron County Weed Board*
 - *NACTA*
 - *Utah Farm Bureau Federation*
 - *Utah Weed Control Association*
- *Iron County Fair* judge
- Judge for *SW Junior Livestock Show*
- *BSA* merit badge counselor

Lee G. Wood

- Member of:
 - *NACTA*
 - *Equine Science Society*
 - *NAEAA*
 - *American Society of Animal Science*
 - *American Quarter Horse Association*
 - *Iron County Cattlemen's Association*
 - *Utah Cattlemen's Association*
- *BSA* merit badge counselor

Cynthia B. Wright

- Member of:
 - *ADA/UDA*
 - *Society for Nutrition Education & Behavior*
 - *Utah Coalition for Ed Technology*
- Reviewer for the *Journal of Family and Consumer Sciences*
- Volunteer for Utah SW Public Health Department

Honors, Awards and Special Recognition

Dean L. Winward

2014 Cattleman of the Year, Iron County Cattlemen's Association



Department of Biology

Mission Statement

The mission of the Department of Biology is to provide our students with personalized, participative educational experiences over a broad range of biological disciplines that promote critical thinking, effective communication and lifelong learning skills. We provide learning opportunities where students can gain the knowledge, develop integrity and acquire the empathy needed to become independent researchers in the advancement of science.

Programs and Degrees Offered

BACHELOR DEGREES:

BA/BS Biology

BA/BS Biology Education

MINOR:

Biology

Student Learning Outcomes

- A. Students will demonstrate an understanding of general knowledge of biology: its language, history, findings and applications.
- B. Students will demonstrate an understanding of the dynamics of interactions and adaptations within and among biological systems.
- C. Students will demonstrate an understanding of the methodologies of science and will synthesize new knowledge from scientific literature.
- D. Students will communicate effectively in oral, written, and other formats.
- E. Students will use appropriate tools to carry out investigations in their intended fields.



Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Angela Acevada	Professional Staff	Greenhouse Specialist	2014
Elizabeth A. Bancroft	Assistant Professor	Zoology, Ecology	2010
Helen C. Boswell	Associate Professor	Evolutionary Biology	1999
Kimberly A. Congdon	Lecturer, Non-Tenure Track	Anatomy	2014
Fredric R. Govedich	Associate Professor, Chair	Zoology, Entomology	2006
Jacqueline B. Grant	Assistant Professor / Museum Curator	Zoology, Botany	2012
Debra A. Hanson	Assistant Professor, Non-Tenure Track	Anatomy, Microbiology	2004
William H. Heyborne	Assistant Professor	Zoology, Herpetology	2011
Jonathan E. Karpel	Assistant Professor	Cellular/Molecular Biology	2010
Ron M. Martin	Associate Professor	Botany	1996
Laurie A. Mauger	Assistant Professor	Genetics	2011
R. Matthew Ogburn	Assistant Professor	Botany	2014
Paul J. Pillitteri	Associate Professor	Anatomy, Physiology	2005
Paul Spruell	Associate Professor	Ecology	2007
John R. Taylor	Associate Professor	Biology Education	2002
Mary Jo Tufte	Lecturer, Non-Tenure Track	Anatomy, Physiology	2010
Matthew S. Weeg	Assistant Professor	Neurobiology	2011

Productivity Highlights 2014-2015

Scholarly Presentations at Professional Meetings

Seirup, E., Gillins, K.; Stevens, B.; Garcia, V.; Hildebrand, T.; Baker, B.; Bancroft, B.A. "The effect of anthropogenic nitrogen and sedimentation on primary producers: do tadpoles matter?", *Ecological Society of America Annual Meeting*, August 2014, Sacramento, CA

Cleveland, C.; Ogburn, R.M.; Hargrave, J.; Bancroft, B.A. "Effect of competition on water-use traits and photosynthetic traits observed in leaf morphology during ancient plant diversity transitions", *Ecological Society of America Annual Meeting*, August 2014, Sacramento, CA

Congdon, K.A.; Ravosa, M.J. "Hands up: pedal digit use during arboreal quadrupedalism and bipedalism in *Propithecus coquerelli*", *American Association of Physical Anthropology Annual Meeting*, March 2015, St. Louis MO

Indergard, M.; Fred Govedich, F.R.; Spruell, P. "Dispersal of fairy shrimp eggs through wind and runoff", *National Conference on Undergraduate Research*, April 2015, Cheney WA

Gardiner, C.; Long, D.; Spruell, P.; Govedich, F.R. "Changes in water chemistry in Cedar City irrigation systems", *National Conference on Undergraduate Research*, April 2015, Cheney WA

Heyborne, W.H.; Perrett, J. "Too quick to flip? Analysis of a flipped classroom pedagogy in an introductory biology classroom", *National Association of Biology Teachers Professional Development Conference*, November 2014, Cleveland OH

Maman S.; Wagstaff, H.; Tufte, M.J.; Weeg M.S. "The effects of *Umbellularia californica* essential oil on the cutaneous vasculature of frogs", *National Conference on Undergraduate Research*, April 2015, Cheney WA

Wagstaff H.; Maman S.; Tufte, M.J.; Weeg, M.S. "The effects of *Umbellularia californica* essential oil on the cutaneous vasculature of frogs", *APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology*, October 2014, San Diego

Documents, Books, and other Publications

Boswell, H.C.; *My Fish Ate Your Fish: Can Evolution and Religion Play Nicely? 3rd edition* Artemathene Books 2015. ISBN 978-1598713688

Govedich, F. R.; Moser, W. E. "Clitellata: Hirudinida and Acenthobdellida" chapter 23 of *Thorp and Covich's Freshwater Invertebrates Volume 1: Ecology and General Biology, 4th edition* Thorp, J.H. and D.C. Rogers editors. Academic Press, Elsevier 2014. ISBN 978-0-1238-5026-3

Bishop, K.W.; Tufte, D.R.; Tufte, M.J. "What happens next? Endgames of a Zombie Apocalypse", chapter 6 of *Economics of the Undead: Zombies, Vampires and the Dismal Science*, Dow, J.P and Whitman G. editors. Rowman and Littlefield 2014. ISBN 978-1-4422-3502-1

Hoverman, J.; Olson, Z.; LaGrange, S.; Grant, J.; Williams, R. *A guide to larval amphibian identification in the field and laboratory* Purdue University Cooperative Extension Service, Forestry and Natural Resources series FNR-496-W



External Grants

Jacqueline B. Grant

- *iUTAH (NSF)* Green roof agriculture exhibit and outreach at the Frehner Museum. February 2015—December 2015 (\$8,224)
- *iUTAH (NSF)* Enhancing biodiversity, water conservation, and urban agriculture through green roof infrastructure (with Matt Weeg, et al). February 2015—December 2015 (\$15,807)

R. Matthew Ogburn

- *NPS* Grand Canyon-Parashant National Monument Herbarium Imaging Project. (with Terri Hildebrand) September 2011—September 2015 (\$25,166)

William H. Heyborne

- *Utah STEM Center* Elementary STEM Partnership- Unleashing Curiosity. (with Edna LaMarca) January 2015—July 2017 (\$190,000)
- *Utah STEM Center* Fairs, Camps and Competitions Award for ISEF Participation April 2015—July 2016 (\$5,729)

Paul Spruell

- *iUTAH (NSF)* Water Chemistry and Microbial Community Composition and Diversity in Irrigation and Runoff Waters in Cedar City. (with Fredric R. Govedich) May 2014—July 2015 (\$22,582)

Professional Memberships and Community Service

Elizabeth A. Bancroft

- Member of *Ecological Society of America*
- Volunteer for *Cedar City Migratory Bird Day*
- Editor or reviewer for:
 - *Animals*
 - *DoD SERDP grant committee*
 - *Human-Wildlife Interactions*
 - *International Journal of Biometeorology*
 - *NSF*
 - *Southwestern Naturalist*

Kimberly A. Congdon

- Member of *Association of Physical Anthropology*

Memberships & Service (continued)

Fredric R. Govedich

- Editor or reviewer for:
 - *Biodiversity Data Journal*
 - *Southwestern Naturalist*
 - *ZooKeys*
- Volunteer for:
 - *Cedar Breaks BioBlast Weekend*
 - *Boy Scouts of America*

Jacqueline A. Grant

- Member of:
 - *NSF iUTAH External Outreach Committee*
 - *Utah Museums Association*
- Public school outreach

William H. Heyborne

- Member and/or reviewer for:
 - *American Malacological Society*
 - *Entomological Society of America*
 - *Human-Wildlife Interactions*
 - *National Association of Biology Teachers*
 - *National Science Teachers Association*
 - *Society for the Study of Amphibians & Reptiles*
 - *Southwestern Naturalist*
 - *The American Biology Teacher*
 - *Utah Academy of Sciences, Arts, & Letters*
- Public school outreach

Jonathan E. Karpel

- Public school outreach

Laurie A. Mauger

- Member of:
 - *Ecological Society of America*
 - *Evolution Society*
 - *Herpetologist League*
 - *IUCN Crocodile Specialist Group*
 - *Utah Academy of Sciences, Arts, & Letters*
 - *Wildlife Society*
- Reviewer for *Herpetologica*
- Volunteer for *Cedar Breaks BioBlast Weekend*

R. Matthew Ogburn

- Volunteer for *Cedar Breaks National Monument*
- Member of:
 - *American Society of Plant Taxonomists*
 - *Botanical Society of America*

Memberships & Service (continued)

John R. Taylor

- Public school and *NPS* outreach
- Board Member of:
 - *Utah Science Teachers Association*
 - *Zion Canyon Field Institute*
 - *Zion Natural History Association*
- Reviewer for *NFS PAEMST* awards

Mary Jo Tufte

- Member *Human Anatomy & Physiology Society*
- Public school outreach

Matthew S. Weeg

- Public school outreach

Scholarly Articles

Holmquist, L.M.; Ray, A.M.; Bancroft, B.A.; Pinkham, N.; Webb M.A.H. "Effects of ultraviolet-B radiation on woundfin embryos and larvae with application to conservation propagation", *Journal of Fish and Wildlife Management*, 5 (1) 2014, 87—98.

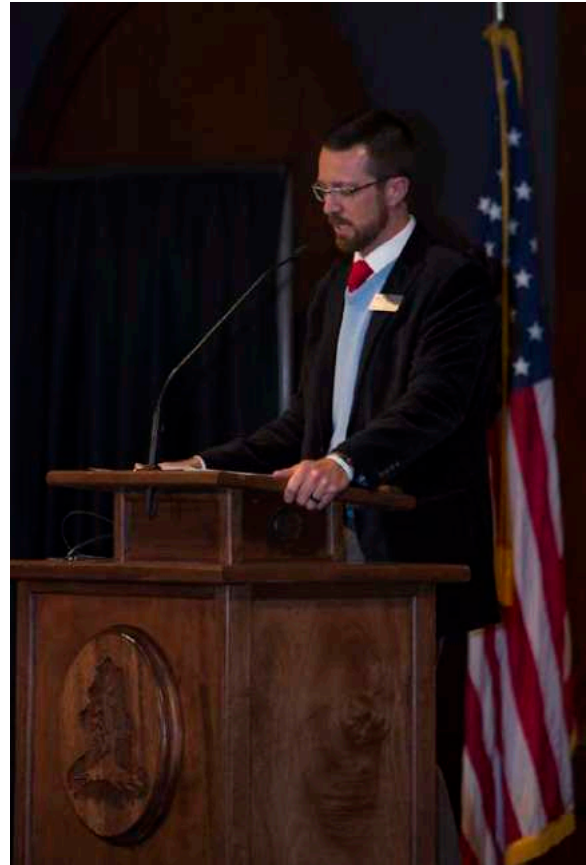
Grant, J.; et al. "iSAW: Integrating structure, actors, and water to study socio-hydro-ecological systems", *Earth's Future*, 3 (3) 2015, 110—132.

Budd, K.M.; Spotila, J.R.; Mauger, L.A. "Preliminary mating analysis of American crocodiles, *Crocodylus acutus*, in Las Baulas, Santa Rosa, and Palo Verde National Parks, Guanacaste, Costa Rica" *South American Journal of Herpetology*, 10 (1) 2015, 4—9.

Honors, Awards and Special Recognition

William H. Heyborne

2015 SUU Thunderbird Advisor of the Year



Department of Computer Science & Information Systems

Mission Statement

The Department of Computer Science and Information Systems (CSIS) supports the mission of the University and the College of Science and Engineering by providing a high quality graduate and undergraduate education to students through certificate, associate, baccalaureate, and master degree programs.

The mission of the Department is to provide a learning-centered environment that enables students, faculty, and staff to achieve their goals and to empower our students to compete on a global level for careers in government, industry, secondary education, and acceptance to graduate school.

The Department provides programs in computer science and information systems. The curricula are rich with opportunities for students to develop a sound understanding of fundamentals as well as specialized theories, practices, and ethics that enhance their learning.

The CSIS faculty are committed to providing high-quality education, individual guidance and assistance to students, helping them to develop the attributes of critical thinking, effective communication, lifelong learning, and individual integrity while pursuing their academic goals as well as engaging in scholarly activities to enhance our classes, involve students and, to assist in the economic development of the region through partnerships with industry, inventors, and entrepreneurs.

Programs and Degrees Offered

BACHELOR DEGREES:

BS Computer Science
BS Information Systems

ASSOCIATE of APPLIED SCIENCE

General Technology with IT specialty
Information Technology
 Networking/Telecommunications Emphasis
 Information Technology Emphasis
 CS and IS Security Emphasis

MINOR:

Computer Science (non-teaching)
Computer Science Emphasis in Teacher Education
Information Systems (non-teaching)

Student Learning Outcomes

General Criteria

- a. An ability to apply knowledge of computing and mathematics appropriate to the discipline;
- b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
- c. An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;
- d. An ability to function effectively on teams to accomplish a common goal;
- e. An understanding of professional, ethical and social responsibilities;
- f. An ability to communicate effectively with a range of audiences;
- g. An ability to analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security and global policy issues;
- h. Recognition of the need for, and an ability to engage in, continuing professional development;
- i. An ability to use current techniques, skills, and tools necessary for computing practice.

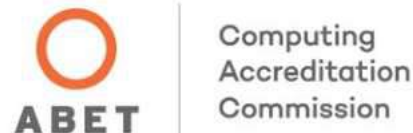
Computer Science Program Criteria

- j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
- k. An ability to apply design and development principles in the construction of software systems of varying complexity.

Information Systems Program Criteria

An understanding of processes that support the delivery and management of information systems within a specific application environment.

Special Accreditation



The CS and IS degrees at Southern Utah University are ABET accredited.

Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Nathan A. Barker	Associate Professor	Bioinformatics, Data Mining	2007
Michael J. Grady	Associate Professor	Algorithms, Computational Mathematics	2001
Cecily Heiner	Assistant Professor	AI, Machine Learning	2011
Shalini Kesar	Associate Professor	E-commerce, Information Security	2007
Laurie L. Harris	Lecturer, Non-Tenure Track	Computer Literacy	2010
Constance W. Nyman	Associate Professor	Computer Education	1970
Robert A. Robertson	Associate Professor, Chair	Network Security	2001
Nasser Tadayon	Associate Professor	Data Mining, Neural Networks	2005
Dezhi Wu	Associate Professor	Human-Computer Interface	2005



Productivity Highlights 2014-15

Scholarly Presentations at Professional Meetings

Heiner, C.. "Leveraging existing budgets and resources", *Computer Science Teachers Association Annual Meeting*, July 2014, St. Charles IL

Nyman, C.; Tadayon, N. "Verification and validation of a database management course," *WorldComp 14*, July 2014, Las Vegas NV

Wang, X; Wu, D.; Teo, H. "Right message at right place: investigating the effectiveness of location-based mobile advertising on consumers' redemption responses," *International Conference on Information Systems*, December 2014, Auckland NZ

Lowry, P.; Zhang, D.; Wu, D. "Understanding patients' compliance behavior in a mobile healthcare system: the role of trust and planned behavior," *International Conference on Information Systems*, December 2014, Auckland NZ

Wu, D.; Lowry, P.; Zhang, D. "Patient compliance behavior in a mobile healthcare system: an integration of theories of rational choice and planned behavior," *48th Hawaii International Conference on Systems Sciences*, January 2015, Kauai HI



Scholarly Articles

Heiner, C. "Stages of group work in CS 1", *Journal of Computing Sciences in Colleges*, 30 (2) 2014, 79—84.

Reychav, I.; Wu, D.; Nir, S.; Boaz, B. "An exploration of 3D spatial training in teams with a remotely controlled robotic system", *International Journal of Learning Technology*, 9 (4) 2014, 338—355.

Reychav, I.; Wu, D. "Are your users actively involved? A cognitive absorption perspective in mobile training", *Computers in Human Behavior*, 44 2015, 335—346.

Documents, Books, and other Publications

Reychav, I.; Wu, D. "Mobile technologies support effective learning", chapter 563 of *Encyclopedia of Information Science and Technology*, 3rd Edition Mehdi Khosrow-Pour editor. IGI Global 2014. ISBN 978-1-4666-5888-2



Professional Memberships and Community Service

Nathan A. Barker

- Member of:
 - *Association for Computing Machinery*
 - *Alpha Chi Honor Society*
 - *Intl Society for Computers and their Apps*

Michael J. Grady

- Member of:
 - *Association for Computing Machinery*

Laurie Harris

- Member of:
 - *Association for Career & Technical Education*
 - *National Center for Women and IT*
 - *Intl Society for Computers and their Apps*

Cecily Heiner

- Grant reviewer for *NSF*
- *Code Camp* judge
- Public school outreach
- Member of:
 - *Association for Computing Machinery*
 - *Computer Science Teachers Association*
 - *National Center for Women and IT*
 - *Rocky Mountain CCSC*

Shalini Kesar

- Editor/reviewer for:
 - *Journal of Information, Communication and Ethics in Society*
 - *Journal of Liability and Scientific Enquiry*
 - *Journal of Research on Women and Gender*
- Organizing committee for *EthiComp 2015*
- *NCWIT Aspirations Award* program leader
- Public school outreach
- Member of:
 - *Association for Computing Machinery*
 - *Association of Information Systems*
 - *London School of Economics Alumni Assoc*
 - *National Center for Women and IT*
 - *UK Academy for Information Systems*

Memberships & Service (continued)

Constance W. Nyman

- Member of:
 - *Association for Career and Tech Ed*
 - *Business and Professional Women's Clubs*
 - *Intl Society for Computers and their Apps*
 - *Phi Kappa Phi National Honor Society*
 - *National Business Education Association*
 - *Utah Business and Comp Ed Association*
 - *Western Business and IT Educators*

Robert A. Robertson

- *Code Camp* judge
- Member of *SWATC* Advisory Board

Nasser Tadayon

- Member of:
 - *Association of Computing Machinery*
 - *IEEE*

Dezhi Wu

- Member of:
 - *Association of Computing Machinery*
 - *Association for Information Systems*
 - *Project Management Institute*
- Reviewer for:
 - *AMCIS 2015* conference
 - *PACIS 2015* conference
 - *Information & Management*
 - *AIS Transactions for HCI*

External Grants

Cecily Heiner, *et al*

- *NSF Utah ECS Initiative* (\$11,000)

Shalini Kesar, *et al*

- *NSF Utah ECS Initiative* (\$3,000)
- *NCWIT Aspiration Award SEED grant* (\$1,500)

Department of Engineering Technology & Construction Management

Mission Statement

The Engineering Technology and Construction Management programs provide students with a broad range of academic instruction and in-depth skill development, in the program discipline areas of Construction Management, Electronics Engineering Technology, CAD/CAM Engineering Technology, CAD/GIS Engineering Technology, through professional, credentialed faculty, using state of the art facilities and equipment. Furthermore, we aim to provide meaningful service to industry, government, and all communities served by the university. The mission of the Department of Engineering Technology and Construction Management is to provide a learning-centered environment that enables students, faculty, and staff to achieve their goals and to empower students to compete on a global level for careers in government, industry, secondary education, and acceptance to graduate school.

The curricula are rich with opportunities for students to develop a sound understanding of fundamentals as well as specialized theories, practices, and ethics that enhance their learning experience. The Engineering Technology and Construction Management faculty are committed to providing high-quality education, individual guidance and assistance to students, helping them to develop the attributes of critical thinking, effective communication, lifelong learning, and individual integrity while pursuing their academic goals to assist in the economic development of the region through partnerships with industry.

Programs and Degrees Offered

BACHELOR DEGREES

BA/BS in:

Construction Management

Engineering Technology (ABET Accredited)

Arch/Civil Design Emphasis



Engineering
Technology
Accreditation
Commission

CAD/CAM Emphasis

CAD/GIS Emphasis

EET Emphasis

ASSOCIATE OF APPLIED SCIENCE

Construction Technology

CAD/CAM Technology

Electronics Technology

General Technology with CT specialty

MINORS

Construction Technology

CAD/CAM Technology

Electronics Technology

CERTIFICATES

Civil Design/CAD

Construction Technology

Student Learning Outcomes

- a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
- b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
- c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
- d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
- e. an ability to function effectively as a member or leader on a technical team;
- f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;
- g. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;
- h. an understanding of the need for and an ability to engage in self-directed continuing professional development;
- i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
- j. a knowledge of the impact of engineering technology solutions in a societal and global context; and
- k. a commitment to quality, timeliness, and continuous improvement.

Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Isabella M. Borisova	Lecturer, Non-Tenure Track	Electronics and Computer Technology	2011
Richard K. Cozzens	Professional in Residence, Non-Tenure Track	2D and 3D Design	2001
Roger A. Greener	Professional Staff	Computer Aided Manufacturing (CAM)	1990
L. Scott Hansen	Associate Professor, Chair	Technology Education	2007
David A. Ward	Associate Professor	Electronics Technology	1985



Productivity Highlights 2014-15

Scholarly Presentations at Professional Meetings

Cozzens, R. "A discussion of ethical issues: web-based concurrent Engineering and Technology curriculum in rural high schools", *1st Annual Ethics Conference*, May 2015, Las Vegas NV

Cozzens, R. "Effective web-based Engineering and Technology curriculum for rural high schools", *2015 SEEDS Conference*, May 2015, Sheffield UK

Documents, Books, and other Publications

Cozzens, R. "TICE 1040 Introduction to architecture using AutoCAD", *UEN eBook* 2015. Available at <http://www.uen.org/concurrent/arch.shtml>

Hansen, L. S. "Autodesk Inventor 2016—A Tutorial Introduction", *SDC Publications* 2015. ISBN 978-1-5850-3961-9

External Grants

Richard Cozzens, *et al*
USHE/USOE *Technology Intensive Concurrent Enrollment* (TICE) grant, July 2013—December 2014 (\$114,000)

Dave Ward, *et al*
• *Carl D. Perkins Career and Technical Education* grant, July 2014—June 2015 (\$104,743)

Professional Memberships and Community Service

Isabella Borisova

- Member of:
 - ASEE
 - Utah Women in Higher Education Network
- Volunteer for Utah SkillsUSA

Richard K. Cozzens

- Public school outreach
- Reviewer for ASEE
- Member of WSU DT Advisory Board
- Fellow for LMU Leeds Sustainability Institute

David A. Ward

- Volunteer for National SkillsUSA



Department of Integrated Engineering

Mission Statement

The mission of the Integrated Engineering program is to support and realize with excellence the overall mission and vision of the University and to provide a broadly based, cross disciplinary engineering education founded upon a design-oriented curriculum which integrates several disciplines into a whole, enabling graduates to undertake the wide variety of design and manufacturing challenges that modern industry faces.

Programs and Degrees Offered

BACHELOR DEGREES

Engineering

ASSOCIATE DEGREES

Pre-Engineering

Special Accreditation



Student Learning Outcomes

- a. an ability to apply knowledge of mathematics, science, and engineering;
- b. an ability to design and conduct experiments, as well as to analyze and interpret data;
- c. an ability to design a system, component, or process to meet desired needs;
- d. an ability to function on multidisciplinary teams;
- e. an ability to identify, formulate, and solve engineering problems;
- f. an understanding of professional and ethical responsibility;
- g. an ability to communicate effectively;
- h. the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- i. a recognition of the need for, and an ability to engage in life-long learning
- j. a knowledge of contemporary issues;
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The Integrated Engineering degree at Southern Utah University is ABET accredited.



Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Roger A. Greener	Professional Staff	Computer Aided Manufacturing (CAM)	1990
Gary A. Flandro	Associate Professor, Chair	Dynamics, Rocketry	2014
Thad S. Morton	Assistant Professor	Fluid Dynamics	2009
John M. Murray	Associate Professor	Mechanical Engineering, Sustainable Design	2007
Matthew Roberts	Professor	Civil Engineering	2014

Productivity Highlights 2014-15

Scholarly Presentations at Professional Meetings

Roy, B.; Roberts, M.W.; Riedl-Farrey, C.; Bies, G.
 “Development of a case study problem in Engineering Economics based on a telephone replacement undertaking at UW – Platteville”, *ASEE North Midwest Sectional Conference*, October 2014, Iowa City IA

Hart, S.D.; Parker, P.J.; Roberts, M.W.; Haden, C.
 “Flipping the infrastructure classroom,” *ASEE Annual Conference*, June 2015, Seattle WA

Professional Memberships and Community Service

Gary Flandro

- Member of *AIAA*

John Murray

- Member of *AAAS*

Matthew Roberts

- Member and reviewer for *ASEE*
- Associate Editor for *Journal of Professional Issues in Engineering Education and Practice*



Documents, Books, and other Publications

Murray, J.M. *et. al.* “DesignBuildBLUFF:Coyote architecture on the Colorado Plateau”, part of chapter 13 in *Eco-Architecture V: Harmonisation between Architecture and Nature*. Brebbia and Pulselli, editors. WIT Press 2014. ISBN 978-1-84564-822-0

Professional Consulting

Gary Flandro

- Gloyer-Taylor Laboratories, LLC

Department of Mathematics

Mission Statement

The Department of Mathematics serves future mathematicians, math educators, scientists, business strategists and engineers. Those pursuing studies in the arts and humanities are also encouraged to study mathematics. Besides reading, no other skills are so highly valued across the breadth of professional society as those that the Department of Mathematics is responsible to teach.

The Department of Mathematics is committed to offering a well-rounded academic program that will enhance the lives of those who take its courses. The demand for mathematical knowledge and skills is high in both industry and education. In secondary schools, the two greatest shortages of qualified teachers across the nation are in mathematics and technology. Also, jobs outlook publications continually rate mathematics as one of the skills most in demand for college graduates, jobs in mathematics and actuarial science continually top lists in job satisfaction surveys

Programs and Degrees Offered

BACHELOR DEGREES

BS Mathematics:

Actuarial Science Emphasis

Pure Math Emphasis

BS Mathematics Education

MINORS

Actuarial Science Emphasis

Pure Math Emphasis

Mathematics Education

Student Learning Outcomes

1. Use standard mathematical techniques to solve computational problems.
2. Demonstrate knowledge of fundamental mathematical concepts and results in the core content areas.
3. Use content knowledge to solve applied and real-world mathematical problems.
4. Communicate mathematics effectively using proper notation and terminology.
5. Use logical reasoning to construct clear and concise mathematical proofs



Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Matthew C. Adams	Lecturer, Non-Tenure Track	Math Literacy	2012
Seth G. Armstrong	Associate Professor, Chair	Partial Differential Equations	2001
Saïd Bahi	Associate Professor	Operations Research	2001
Bryan L. Bradford	Lecturer, Non-Tenure Track	Math Literacy	2013
James P. Brandt	Associate Professor	History of Math, Math Education	2006
Sarah M. Duffin	Associate Professor	Partial Differential Equations	2004
Roger Fischer	Assistant Professor	Math Education	2014
Eric M. Freden	Associate Professor, Interim Associate Dean	Geometric Group Theory	1997
Jian Long Han	Associate Professor	Partial Differential Equations	2005
Derek W. Hein (<i>on sabbatical</i>)	Associate Professor	Combinatorial Design Theory	2004
Jana R. Lunt	Assistant Professor	Math Education	2010
Gretchen R. Meilstrup	Assistant Professor	Algebraic Geometry	2008
Mark H. Meilstrup	Assistant Professor	Geometric Group Theory	2011
Andrew F. Misseldine	Lecturer, Non-Tenure Track	Representation Theory	2014
Emma L. Schafer	Assistant Professor	Finite Group Theory	2012
Andreas J. Weingartner	Professor	Number Theory, Actuarial Science	1999
Cecilia L. Weingartner	Lecturer, Non-Tenure Track	Numerical Methods	2008

Productivity Highlights 2014-15

Scholarly Presentations at Professional Meetings

Brandt, J.P.; Lunt, J.R.; Meilstrup, G.R.
“Mathematicians and mathematics educators perspectives on ‘doing mathematics’”, *2015 Joint Mathematics Meeting*, January 2015, San Antonio TX

Brandt, J.P.; Lunt, J.R.; Meilstrup, G.R.
“Emphasizing mathematical definitions in a College Algebra course”, *2015 Joint Mathematics Meeting*, January 2015, San Antonio TX

Duffin, S.M. “The numerical analysis for a predator-prey model with strong Allee effect in prey and with Holling type II functional response”, *MAA Intermountain Section Meeting*, March 2015, Provo UT

Fischer, R. “Fractions, decimals, and rational numbers: promoting a unified understanding of number in the Middle School Classroom”, *Utah Council of Teachers of Mathematics Annual Meeting*, November 2014, Latyon, UT

Fischer, R. “Rational numbers and the Common Core state standards: a descriptive case study”, *2015 Joint Mathematics Meeting*, January 2015, San Antonio TX

Freden, E.M. “Growth series for rooted trees”, *32nd Annual Workshop in Geometric Topology*, June 2015, Fort Worth TX

Han, J.; “Numerical approximation of a Lotka-Volterra system”, *MAA Intermountain Section Meeting*, March 2015, Provo UT

Hein, D.W.; “A new construction for decompositions of λK_n into LE graphs”, *MAA Intermountain Section Meeting*, March 2015, Provo UT

Hein, D.W.; “Decompositions of λK_n into LEO and ELO graphs”, *28th Midwestern Conference on Combinatorics and Combinatorial Computing*, October 2014, Las Vegas NV

Scholarly Articles

Armstrong, S.G.; Han, J.; Duffin, S.M.; Zhang, C.
“Long-term behavior and numerical analysis of a nonlocal evolution equation with Kac potentials”, *SIAM Journal on Mathematical Analysis*, 47 (2) 2015, 1234—1252

Weingartner, A.J. “Integers with dense divisors 3”, *Journal of Number Theory* 142 2014, 211—222

Documents, Books, and other Publications

Brandt, J.P.; Meilstrup, G.R. “Assessing the effectiveness of classroom visual cues”, Chapter 5 in *Doing the Scholarship of Teaching and Learning in Mathematics*, Dewar & Bennet, editors. Mathematical Association of America January 2015. ISBN 978-0-8838-5193-7

External Grants

Jana Lunt (PI) with Fred Govedich, Bruce Howard, John MacLean

- S-STEM (NSF) Scholarships for STEM majors, August 2012—July 2017 (\$575,000)



Professional Memberships and Community Service

James P. Brandt

- Member of *Mathematical Association of America*

Bryan L. Bradford

- *Sterling Scholar* judge

Roger Fischer

- Public school outreach
- Member of *Association of Mathematics Teacher Educators*

Eric M. Freden

- Member of
 - *American Mathematical Society*
 - *Phi Beta Kappa*

Jianlong Han

- Member of *Mathematical Association of America*

Mark H. Meilstrup

- Member of *American Mathematical Society*

Gretchen R. Meilstrup

- Member of *Mathematical Association of America*

Andrew F. Misseldine

- *Sterling Scholar* judge
- Member of *American Mathematical Society*

Emma L. Schafer

- Public school outreach
- Member of *Mathematical Association of America*

Andreas J. Weingartner

- Member of *American Mathematical Society*



Department of Nursing

Mission Statement

The Department of Nursing is made up of academic programs that prepare individuals for professional nursing practice. A Bachelor of Science in Nursing is recommended for students preparing for entry into nursing practice. We offer a learning-centered education that meets the requirements for a baccalaureate degree at SUU and ensures that graduates have the abilities to be successful professional nurses. The purpose of the Department of Nursing is to provide learning opportunities that engage students in a comprehensive program of classroom and experiential learning that emphasizes caring, critical thinking, problem solving, ethical decision making, and communication.

Student Learning Outcomes

- A. Students will provide quality professional nursing care based on a synthesis of theoretical and empirical knowledge from nursing, physical and social sciences, arts and humanities, and life experiences.
- B. Students will use evidence as the basis for clinically competent contemporary nursing care.
- C. Students will communicate effectively using various means in a variety of roles and settings.
- D. Students will optimize health care to diverse individuals, families, groups and communities through collaboration with interdisciplinary health care teams.
- E. Students will demonstrate intellectual curiosity, critical thinking, and motivation toward life-long learning.
- F. Students will influence the quality of nursing and health care using leadership skills, management concepts, and a knowledge of the political system.
- G. Students will be legally and ethically accountable for clinical nursing practice.
- H. Students will assume the role of generalist nurse and become responsible members of the profession

Special Accreditation



The baccalaureate program at Southern Utah University is accredited by the Commission on Collegiate Nursing Education.

Programs and Degrees Offered

BACHELOR DEGREES

- BS Nursing:
- Pre-Licensure Emphasis
 - RN to BSN Emphasis



Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Elizabeth A. Hatfield	Professional Staff	Nursing Lab Specialist	2002
Selwyn Layton	Assistant Professor, Non-Tenure Track	Nursing Education	2009
Donna J. A. Lister	Associate Professor, Chair	Clinical Nursing	2005
Ray Munson	Visiting Assistant Professor	Nursing Lab Specialist	2014
Alan H. Pearson	Assistant Professor	Medical/Surgical Nursing	2005
Rebecca S. Rasmusson	Assistant Professor, Non-Tenure Track	Family Nursing	2006
Shelley R. Sanderson	Assistant Professor, Non-Tenure Track	Family Nursing	2010
Heidi Schneider	Assistant Professor, Non-Tenure Track	Family Nursing	2014
Daphne A. Solomon	Assistant Professor, Non-Tenure Track	Acute Care	2013
Kevin D. Tipton	Assistant Professor, Non-Tenure Track	Geriatric Nursing	2006



Productivity Highlights 2014-15

Scholarly Presentations at Professional Meetings

Lister, D.J.A. "The difference you make in Nursing Education", *Utah Student Nurse Association Convention*, February 2015, Layton UT

Sanderson, S.R. "How to become a Family Nurse Practitioner", *Utah Student Nurse Association Convention*, February 2015, Layton UT

Schneider, H. "Emergency nursing", *Utah Student Nurse Association Convention*, February 2015, Layton UT

Solomon, D. "The signs, symptoms, and diagnostic criteria of inflammatory breast cancer", *Utah Student Nurse Association Convention*, February 2015, Layton UT

Solomon, D. "Forensic Nursing: sexual assault nurse examiner and child abuse", *Utah Student Nurse Association Convention*, February 2015, Layton UT

Professional Memberships and Community Service

Selwyn Layton

- Member of:
 - *American Association of Critical Care Nursing*
 - *American Nurses Association*
 - *Emergency Nurses Association*
 - *National League of Nursing*
 - *Utah Nurses Association*
- BSA leader
- Medical volunteer for *Utah Summer Games*

Donna J. A. Lister

- Board member of:
 - *Southern Utah Veterans Home (Ivins UT)*
 - *Utah Organization of Nurse Leaders*
 - *Valley View Medical Center*
- Member of:
 - *Academic Leadership Committee*
 - *American Association of Nurse Practitioners*
 - *National League of Nursing*
 - *Utah Nurses Association*
 - *Valley View Medical Staff Association*
 - *Association of Utah Nurse Practitioners*

Memberships and Service, continued

Ray A. Munson

- Member of *National League of Nursing*

Alan H. Pearson

- Member of:
 - *National League of Nursing*
 - *Valley View Medical Staff Association*

Rebecca S. Rasmusson

- Member of:
 - *Association of Utah Nurse Practitioners*
 - *Beaver Valley Hospital Medical Staff Association*
 - *National League of Nursing*
 - *SWATC Advisory Board*
 - *Utah Nurses Association*

Shelly R. Sanderson

- Member *National League of Nursing*
- Public School Outreach

Heidi Schneider

- Member of:
 - *Association of Utah Nurse Practitioners*
 - *Emergency Nurses Association*

Daphne A. Solomon

- Member of:
 - *American Association of Nurse Practitioners*
 - *Association of Utah Nurse Practitioners*
 - *Five County Children's Justice Center*
 - *International Association of Forensic Nurses*
 - *National League of Nursing*
 - *Utah Nurses Association*
- Medical volunteer for *Utah Summer Games*

Kevin D. Tipton

- Member of:
 - *American Nurses Association*
 - *American Organization of Nurse Executives*
 - *Emergency Nurses Association*
 - *Mothers Against Drunk Driving*
 - *National League of Nursing*
 - *Utah Nurses Association*
 - *Valley View Medical Center ER Council*

Department of Physical Science

Mission Statement

The mission of the Department of Physical Science is to provide an environment that fosters academic excellence in physical science disciplines. The Department of Physical Science at Southern Utah University offers undergraduate programs in Chemistry, Geosciences, Geographic Information Systems, and Physics. We operate several special learning environments for students that include a nationally certified environmental water laboratory, a GIS lab, a scanning electron microscopy lab, an astronomical observatory, the Edward & Shirley Stokes open chemistry lab, and a thin section preparation laboratory. We provide comprehensive classroom and experiential learning environments that accentuate critical thinking, problem solving, decision making, and communication in the physical sciences. We also serve as the center of physical science knowledge and expertise for southern Utah.

Programs and Degrees Offered

BACHELOR DEGREES

BA/BS Physical Science:
Teacher Education Emphasis

BS Chemistry:
Professional Emphasis
Health Care Emphasis
Forensic Emphasis
Teacher Education Emphasis

BS Geology:
Professional Emphasis

MINORS

Chemistry
Chemistry Teacher Education
Geography
Geography Teacher Education
Geology Teacher Education
Physics
Physics Teacher Education

CERTIFICATES

Geographic Information System

Student Learning Outcomes

Chemistry

- A. Students should be able to define problems clearly, develop testable hypotheses, design and execute experiments, analyze data using appropriate statistical methods, and draw appropriate conclusions.
- B. Students should be able to use the peer-reviewed scientific literature effectively and evaluate technical articles critically.
- C. Students should understand responsible disposal techniques, understand and comply with safety regulations, understand and use material safety data sheets (MSDS), recognize and minimize potential chemical and physical hazards in the laboratory, and know how to handle laboratory emergencies effectively
- D. Students should be able to present information in a clear and organized manner, write well-organized and concise reports in a scientifically appropriate style.

Geology

Students will demonstrate mastery of the following outcomes:

- A. Knowledge of the physical and natural world
- B. Integrative learning through teamwork, problem solving, inquiry, and analysis
- C. Introduction and development of geological field and lab skills
- D. Written and oral scientific communication

Special Accreditation



Although not a formal accrediting body, the American Chemical Society's Committee on Professional Training establishes guidelines and procedures for the approval of bachelor's degrees in programs in chemistry. The Chemistry Professional Emphasis degree at Southern Utah University is approved by the ACS

Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Kristina B. Bronsema	Professional Staff	Lab Specialist	1997
Daniel J. Eves	Assistant Professor	Bio-analytical Chemistry	2009
Robert L. Eves	Professor, Dean	Geochemistry	1988
Nathan A. Hanson	Lecturer, Non-Tenure Track	Physics/Astronomy	2011
Jennifer E. Hargrave	Assistant Professor	Paleontology	2011
Bruce R. Howard	Associate Professor	Biochemistry	2002
Jason Kaiser	Assistant Professor	Mineralogy	2014
Paul R. Larson	Associate Professor	Geography	1994
John S. MacLean	Assistant Professor	Structural Geology	2010
David J. Maxwell	Professional Staff	GIS	1997
Amber C. McConnell	Assistant Professor	Physical Chemistry	2012
Christopher F. Monson	Assistant Professor	Analytical Chemistry	2011
M. Takeshi Nakata	Visiting Assistant Professor	Computational Physics	2014
J. Ty Redd	Professor, Chair	Organic Chemistry	1990
Hussein A. Samha	Professor	Inorganic Chemistry	2001
Brent A. Sorensen	Associate Professor	Physics/Astronomy	1983
Mackay B. Steffensen	Associate Professor	Organic Chemistry	2006
Suzanne Tegland	Visiting Lecturer	Chemistry	2014
Elaine Vickers	Visiting Assistant Professor	Inorganic Chemistry	2014
Kim H. Weaver	Associate Professor	Analytical Chemistry	2000
Nathan S. Werner	Assistant Professor	Organic Chemistry	2012

Productivity Highlights 2014-15

Scholarly Presentations at Professional Meetings

- Eves, D.J.; "Application of principles learned at a forensic science workshop", *Biennial Conference for Chemical Education*, August 2014, Allendale MI
- Eves, D.J.; Redd, J.T.; Weaver, K.H. "Southern Utah University internship: a working model of peer mentorship", *American Chemical Society Annual Meeting*, March 2015, Denver CO
- Davis, L.E.; Eves, R.L.; Pollock, G.L. "Hoodooos and headward erosion: Bryce Canyon National Park's unique Geologist-in-Residence Program" *Geological Society of America Annual Meeting*; October 2014, Vancouver BC
- Cleveland, C.E.; Hargrave, J.E.; Bancroft, B.A.; Ogburn, R.M. "Complexities of modern leaf morphology, climate proxies, and applicability in the fossil record", *Geological Society of America Annual Meeting*; October 2014, Vancouver BC
- Christensen, P.D.; Hargrave, J.E. "Monitoring the destruction and natural recovery of a monsoon-dominated stream system after a wildfire damages its watershed, Stout Canyon, Utah" *Geological Society of America Annual Meeting*; October 2014, Vancouver BC
- Hargrave, J.E.; Hargrave, R.G. "Teaching observational skills and practical field methods in a core geology course", *Geological Society of America Annual Meeting*; October 2014, Vancouver BC
- McLemore, D.M.; Hargrave, J.E., "Fossil coral from the Mississippian Redwall Limestone in the Beaver Dam Mountains, Washington County, Utah", *Geological Society of America Annual Meeting*; October 2014, Vancouver BC
- Yon, J.C.E.; Chipman, J.; Hargrave, J.E.; "An interactive invertebrate fossil location map of the great state of Utah", *Geological Society of America Annual Meeting*; October 2014, Vancouver BC

Scholarly Presentations, continued

- MacLean, J.S.; Green, M. "Mapping three generations of fractures in Bryce Canyon National Park: a Geocorps™ America Internship", *Geological Society of America Annual Meeting*; October 2014, Vancouver BC
- Skanky, R.; MacLean, J.S. "Porosity analysis of deformation bands in sandstones and conglomerates from Hillsdale Canyon, southern Utah", *Geological Society of America Annual Meeting*; October 2014, Vancouver BC
- Bash, J.; MacLean, J.S.; Tobler, R. "Reflection and assessment: evaluating the honors contract experience", *National Collegiate Honors Council*, November 2014, Denver CO
- MacLean, J.S.; White, B.J., "Citizen science and the role of service learning in experiential education", *National Collegiate Honors Council*, November 2014, Denver CO
- West, T.; Penrose, A.; Toussaint, S.; McConnell, A.C. "Investigating the synthesis of bis(4-pyridyl)acetylene and the potential role in molecule-based magnets", *American Chemical Society Annual Meeting*, March 2015, Denver CO
- Weaver, K.B.; Stewart, R.; Macfarlane, S.; McConnell, A.C. "Southern Utah University General Chemistry case study: identification of curriculum obstacles", *American Chemical Society Annual Meeting*, August 2014, San Francisco CA
- Weaver, J.B.; Steffensen, M. B. "Synthesis, analysis, and biological activity of novel organoarsenic compounds", *American Chemical Society Annual Meeting*, March 2015, Denver CO

Honors, Awards and Special Recognition

John S. MacLean
SUU Thunderbird Professor of the Year

Scholarly Publications

Eves, D.; Redd, J.T. "General Chemistry II: Setting the stage on the first day with 'Jeopardy'", *Journal of College Science Teaching*, 43 (9) 2014, 41—45

Davis, L.E.; Eves, R.L.; Even, P.; Walters, J.C. "Sigma Gamma Epsilon's W.A. Tarr Award: honoring the memory of William Arthur Tarr (1881-1939), Grand Editor of The Compass," *The Compass: Earth Science Journal of Sigma Gamma Epsilon*, 86 (4) 2014 Article 4. Available at: <http://digitalcommons.csbsju.edu/compass/vol86/iss4/>

Cleveland, C.E.; Hildebrand, T.J.; MacLean, J.S.; Hargrave, J.E. "Insights into the late Quaternary paleoenvironment of Northwestern Arizona", *Southwestern Naturalist* 60 (1) 2015

Kirkland, J.I.; Milner, A.R.C.; Olsen, P.E.; Hargrave, J.E. "The Whitmore Point Member of the Moenave Formation in its type area in northern Arizona and its age and correlation with the section in St. George, Utah—evidence for two major lacustrine sequences", in *Geology of Utah's Far South*, MacLean, J.S., Biek, R.F., and Huntoon, J.E., editors. Utah Geological Association Publication 43 2014, 321—356

MacLean, J.S. "Reactivation of conjugate fractures in the Claron Formation near Bryce Canyon National Park, Utah", in *Geology of Utah's Far South*, MacLean, J.S., Biek, R.F., and Huntoon, J.E., editors. Utah Geological Association Publication 43 2014, 639—650.

Cleveland, C.E.; Garrard, R.M.; McLemore, D.M.; Yon, J.C.E.; Kidman, G.; MacLean, J.S. "Strain accommodation in the footwall of the Rubys Inn Thrust Fault, Hillsdale Canyon, Southern Utah", *The Compass: Earth Science Journal of Sigma Gamma Epsilon*, 86: (4) 2014 Article 2. Available at: <http://digitalcommons.csbsju.edu/compass/vol86/iss4/>

Francisco, S; MacLean, J.S. "Five tectonic settings in five National Parks and Forests: a field camp experience", *The Compass: Earth Science Journal of Sigma Gamma Epsilon*, 86: (2) 2014 Article 2. Available at: <http://digitalcommons.csbsju.edu/compass/vol86/iss2/>

Scholarly Publications, continued

Kidman, G.; MacLean, J.S.; Maxwell, D., "Evidence of large-scale tectonic processes on the Tharsis Rise, Mars", *The Compass: Earth Science Journal of Sigma Gamma Epsilon*, 86: (2) 2014 Article 1. Available at: <http://digitalcommons.csbsju.edu/compass/vol86/iss2/>

MacLean, J.S. *et al.* "Proterozoic supercontinental restorations: constraints from provenance studies of Mesoproterozoic to Cambrian clastic rocks, eastern Siberian Craton", *Precambrian Research*, 259 2015, 78—94

Weaver, J.B.; Lamb, C.; Weaver, K.H.; Kaiser, J.; Redd, J.T. "Characterization of the major ions of Coal Creek near Cedar City, Utah", *The Compass: Earth Science Journal of Sigma Gamma Epsilon*, 86: (4) 2014 Article 1. Available at: <http://digitalcommons.csbsju.edu/compass/vol86/iss4/>

Steffensen, M.B.; Rotem, D.; Bayley, H. "Single-molecule analysis of chirality in a multicomponent reaction network" *Nature Chemistry*, 6 (7) 2014, 603—607

Harper, L.A.; Weaver, K.H.; De Visscher, "A. dinitrogen and methane gas production during the anaerobic/anoxic decomposition of animal manure" *Nutrient Cycling in Agroecosystems*, 100 (1) 2014, 53—64

Documents, Books, and other Publications

MacLean, J.S.; Biek, R.F.; Huntoon, J.E., editors, *Geology of Utah's Far South* Utah Geological Association Publication 43 2014 (DVD). Available at <http://www.mapstore.utah.gov/Utah-Geological-Association/>

Professional Consulting

J. Ty Redd

- Reviewer for *Altius Test Prep*, Fall 2014 (substantial in-kind payment)

Mackay B. Steffensen

- Preparation of Orion Adaptive Modules in *Organic Chemistry* Wiley & Sons, Summer 2014 (\$1500)

Professional Memberships and Community Service

Daniel J. Eves

- BSA merit badge counselor
- Member of:
 - *American Chemical Society*
 - *National Science Teachers Association*

Nathan A. Hanson

- Public school outreach

Jennifer E. Hargrave

- Member of:
 - *Colorado Plateau Field Advisory Council*
 - *Geological Society of America*
 - *Society of Vertebrate Paleontology*
 - *National Association of Geoscience Teachers*
- Public school outreach

Bruce R. Howard

- Member of:
 - AAAS
 - *American Chemical Society*
- Public school outreach

Jason Kaiser

- Member of:
 - *Geological Society of America*
 - *Utah Geological Association*
 - *American Geophysical Union*
 - *National Association of Geoscience Teachers*
 - *National Collegiate Honors Council*
- Public school outreach

Paul R. Larson

- Member of:
 - *Association of American Geographers*
 - *Executive Board, Utah National Parks Council*
 - *Iron County Historical Society*
 - *National Council for Geographic Education*
 - *National Geographic Society*
 - *Phi Kappa Phi*

John S. MacLean

- Member of:
 - *Geological Society of America*
 - *Utah Geological Association*
 - *National Association of Geoscience Teachers*
 - *Steering committee for Partners in the Parks*
- Public school outreach

David J. Maxwell

- Member of:
 - *Utah Geographic Information Council*
 - *Five Counties GIS User Group*
 - *Southern Utah Technology Council*
- Mapping LDS ward boundaries
- Public school outreach

Amber C. McConnell

- Member of:
 - *American Chemical Society*
 - *National Association for Women in Science*
 - *National Science Teachers Association*

Christopher F. Monson

- Member *American Chemical Society (ACS)*
- Reviewer for *Journal of the ACS*
- Public school outreach

J. Ty Redd

- Member *American Chemical Society*
- Public school outreach

Hussein A. Samha

- Public school outreach

Mackay B. Steffensen

- BSA merit badge counselor
- Member *American Chemical Society*
- Public school outreach

Brent A. Sorensen

- Public star parties

Kim H. Weaver

- Reviewer for *Journal of Environmental Quality*

Nathan S. Werner

- Member *American Chemical Society*
- Public school outreach

External Grants

David J. Maxwell, Bridget Eastep

- CPCESU Zion and Bryce Canyon NP Archeological GIS support, 2011—2015, extended through July 2015 2014 (\$48,000)
- *Forest Service (USDA)* GIS mapping cooperative agreement, 2015 (\$100,000)



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