

2012-  
2013

# Walter Maxwell Gibson College of Science and Engineering Annual Report

L.S. & ALINE W. SKAGGS  
CENTER FOR HEALTH & MOLECULAR SCIENCES



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## EXECUTIVE SUMMARY 2012-2013

### Summer 2013

The Walter Maxwell Gibson College of Science and Engineering (WMG COSE) has much to reflect positively upon at the end of the 2012-2013 academic year. This executive summary highlights some of the accomplishments, events, and productivity which all indicate the level of dedication of the talented faculty in this college.

1. On June 27<sup>th</sup>, 2013, the WMG COSE and campus-at-large celebrated the naming event for the Science Center Addition (SCA). Thanks to a generous gift from the ALSAM Foundation and members of the L.S. (Sam) and Aline W. Skaggs family, the former SCA is now officially named the L.S. and Aline W. Skaggs Center for Health and Molecular Sciences. The ALSAM Foundation provided a portion of the funding utilized in construction of the facility, but also provided endowment funds to support student scholarships and undergraduate research activities. Many generations of WMG COSE students will benefit from the generosity of the Skaggs family.
2. Our healthcare professional acceptance success continues. Data for the 2012-13 academic year, shows that 88% of COSE applicants were accepted to medical school; 90% of dental school applicants were successful; 100% of COSE graduates who applied for pharmacy admissions were accepted, and 80% of applicants to PA schools. 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 consistently exceeds national norms. Our student's pass-rate on the national standardized licensure exam (NCLEX-RN) has averaged 94.46% for the last six semesters (the national average over the same period is 89%). 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 COSE Professors John R. Taylor and Mackay B. 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. This year marks the 9<sup>th</sup> year of the Southern Utah Center for Computing, Engineering, and Science Students (SUCCESS) Academy partnership with SUU. Of the 92 graduates, more than 86 earned SUU Associate of Science degrees in 2013 while completing their high school diplomas. School wide SUCCESS Academy at SUU earned 5851 concurrent enrollment credits from Southern Utah University and paid over \$100,000 dollars in tuition costs for Senior participation in on campus courses. Over 80% of the graduating class will attend SUU to complete their Bachelor of Science degree. This has been a very 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 over 4,800 4<sup>th</sup>-6<sup>th</sup> students in the last fourteen years. This summer Professor Wittwer and her staff served 373 elementary students from 66 different Utah towns in nine separate camps, with 327 others turned away for lack of space. In addition CMSC offered a program for 36 middle school students who enjoyed five days and four nights rafting along the San Juan River. More information is available at: <http://suu.edu/cose/center/>.

7. The College underwent an extensive Program Review in 2012-13 as mandated by Utah State Board of Regents. Results from both external and internal review committees were very positive and can be found at <http://suu.edu/cose/report.html>
8. The Center for Applied Research and Advanced Technology (CARAT) is being reorganized and revitalized. 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>
9. The College was successful in obtaining numerous grants. The largest interdisciplinary grants include:
  - WMG COSE obtained 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 Lunt and her team consisting of Bruce Howard, Glen Longhurst, John MacLean and Fred Govedich. There were 15 *S-STEM* scholarships awarded in 2012-2013.
  - US Forest Service awarded a grant to Briget Eastep (SUU Outdoor Engagement Center) and Ron Martin (Biology) for the period 2010-2103 in the amount of \$413,500.
  - Other grants are listed in the department summaries.
10. The *Fourth Annual COSE Undergraduate Research Symposium* was held on November 12, 2012. This event was an opportunity to showcase student-faculty research in the College of Science and Engineering. Presentations included in-progress and more complete research presentations. Inter-departmental collaborative presentations were particularly encouraged. There were 41 faculty mentored student presentations (oral and poster) at this year's meeting. You can check out the abstracts and some photos at: <http://suu.edu/cose/symposium/>.
11. WMG COSE offered numerous high school outreach events during 2012-13, 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/mathcontestpage.htm>)
  - Southern Utah Science and Engineering Fair (<http://suu.edu/cose/fair/>)
  - 11<sup>th</sup> Annual Chemical Olympics (<http://suu.edu/faculty/samha/chemolympics/>)
  - Technology Fair (<http://suu.edu/cose/techfair/>)
  - Engineering, Technology, and Computer Science Summer Camp (<http://suu.edu/cose/summercamp.html>)
  - High School Interactive Experiences (<http://suu.edu/cose/hsie/>)
12. This has been a productive year for College faculty. For the 2012-2013 academic year, the following data were reported:
  - Refereed Scholarly Publications – 25
  - Refereed Presentations at Professional Meetings – 47
  - Books and other documents authored – 5
  - Funded Grants – 7
  - Special Recognitions and Awards – 2
13. Beginning 1 July 2013, five of our faculty obtained tenure and promotion to Associate Professor: Jim Brandt, Fred Govedich, Donna Lister, Mackay Steffensen, and Chunlei Zhang. Dr. Andreas Weingartner was promoted to Full Professor. We acknowledge the retirement of Claudia Kreipl and resignations of Mark Colberg, Matthew Edwards, Aja James, and Chunlei Zhang at the end of the 2012-2013 academic year and are grateful for their respective contributions to the College.



## MESSAGE FROM THE DEAN



We note, with regret, the passing of L.S. (Sam) Skaggs this past year, and we offer his wife Aline and the Skaggs family most heartfelt condolences. Sam Skaggs was an innovator in business, and a visionary with a real passion for education and improving people's lives. His good works continue through the efforts of the ALSAM Foundation, an organization that has given hundreds of millions of dollars to education and health research by way of scholarships, and the establishment or funding of a wide number of university and research centers.

One of the most significant events of the past year was the formal recognition of the \$2 million gift by the ALSAM Foundation on June 27<sup>th</sup>. A portion of their gift was used to offset the SUU contribution to the construction of the new facility, which has added so much to our laboratory and undergraduate research opportunities. However, the majority of the gift has been used to endow scholarships and provide ongoing funding to support student research in the College. The naming event featured remarks by Kezia Brown, a recent graduate and the 2013 WMG COSE Valedictorian, who has benefited from both a scholarship and research support and by Dr. Nathan Werner, a faculty member in chemistry who has been able to provide research support to students as a result of the gift. A beautiful portrait of Sam and Aline was unveiled as part of the activities and currently resides on the first floor of the L.S. and Aline Skaggs Center for Health and Molecular Sciences. Following the formalities, guests were treated to a unique repast of bubbling liquids and test tubes filled with "sandy candy".

It is our privilege to work with outstanding students. Each year, it seems the list of their accomplishments grows. As an example, the 2013 SUU Valedictorian was Ms. Choryn S. Glad, a dual biology/zoology and chemistry (forensic science emphasis) major. Choryn completed her undergraduate training in these two challenging majors with a perfect 4.0 GPA. She has worked as both a mathematics tutor and chemistry teaching assistant and also completed a research internship with Dr. Mike Shapiro at the University of Utah. Finally, Choryn was the first recipient of the College's most prestigious (and lucrative) scholarship, named in honor of Alice Solvej Lind Gibson.

During this past year, the WMG COSE underwent academic program review. I appreciate the efforts of Associate Dean Eric Freden in orchestrating this major undertaking, and the site visits by external reviewers Dr. David Matty (Dean of Science, Weber State University), Dr. Scott Danielson (Associate Dean, College of Technology and Innovation, Arizona State University), and Dr. Larry Davis (College of St. Benedicts-St. John's University). The review has been very helpful to programs and departments as they make plans to move forward.

Each year, as I reflect on the accomplishments of this College, I gratefully recognize the contributions of our outstanding students, committed faculty, and tireless staff. It is a pleasure to work with such consummate professionals.

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:
  - 88% acceptance to medical schools
  - 90% acceptance to dental schools
  - 100% acceptance to pharmacy schools
  - 50% acceptance to physical therapy programs
  - 80% acceptance to PA 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 2012-13, the following were reported:
  - Educational Testing Service (ETS) Major Field Exams
    - Chemistry–85<sup>th</sup> percentile student average
    - Biology–56<sup>th</sup> percentile student average
    - Mathematics–75<sup>th</sup> percentile student average
    - Math Ed–55<sup>th</sup> percentile student average
  - American Chemical Society (ACS) end of course exams
    - Average for all Summer 2012 sections: 70<sup>th</sup> percentile
    - Average for all Fall 2012 sections: 66<sup>th</sup> percentile
    - Average for all Spring 2013 sections: 69<sup>th</sup> percentile
  - NCLEX national standardized nursing licensure exam
    - 94% pass rate for Fall 2011
    - 94% pass rate for Spring 2012

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 2012-13

- 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 4<sup>th</sup> Annual 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.

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 the dean during 2012-13.
- 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 continues to support the SUU agriculture program.
- The Mountain Ranch, working through the Mountain Ranch Resource Advisory Council (RAC), signed a Memorandum of Understanding (MOU) with the UT Division of Forestry, creating the state's first Demonstration Forest.
- Cedar Mountain Science Camp served 373 students from 66 cities/towns in nine separate camps and continues to have many 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
- The Casting/Welding Lab allows the physical realization of design projects for engineering and technology students.

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.

##### Nutrition Science

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 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 (examples of coursework that can be used toward a BIS degree include Agribusiness, Animal Science, Plant Science and General Agriculture)

BS Human Nutrition/Allied Health

BS Human Nutrition/Pre-Dietetics

##### ASSOCIATE DEGREES

Agriculture: Livestock and 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.

##### Nutrition Science

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 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
Matthew C. Schmidt	Associate Professor	Human Nutrition	2001
Randall Violett	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 2012-13

## Scholarly Presentations at Professional Meetings

Wright, C.B. "Using online video demonstrations in a culinary arts class" *Annual Meeting of the SNEB*, July 15 2012, Washington DC

Gasser C. L. "Pubertal issues for beef replacement heifers", *2012 ADSA, AMPA, ASAS, CSAS, WSASAS Joint Annual Meeting*, July 18 2012, Phoenix AZ

Gasser, C. L. "Investing in reproduction" *4<sup>th</sup> Annual Cowman's Reproduction Workshop*, September 18 2012, Alton UT

Christiansen S.; Schmidt, M. "Using Study Abroad as a context for teaching Family and Consumer Sciences" *5<sup>th</sup> Annual Scholarship of Teaching & Engagement Conference*, March 28-29 2013, UVU Provo UT

Clark, N. "The engaged campus: integrating Service-Learning into a community nutrition course" *Utah Campus Compact Annual Faculty Institute*, February 8-9 2013, Moab UT

Gubler, R; Grady, A; Croxall, K. "Keepers of the flame: connecting FCS professionals through annual in-service training meetings" *AAFCS Annual Meeting*, June 26 2012, Indianapolis IN

Winward, D. "Weed dissemination: how did it/they get there" *Arizona Strip/Southern Utah Invasive Weed Workshop*, August 22 2012, St. George UT

## Scholarly Publications

Gasser, C. L. "JOINT ALPHARMA-BEEF SPECIES SYMPOSIUM: Considerations on puberty in replacement beef heifers" *Journal of Animal Science* 91 (3) 2013, 1336—1340.

Heflebower, R.; Reid, C.; and Winward D. "Controlling curly top of tomato using resistant varieties and row covers" *Journal of the NACAA* 5 (2) 2012.

## Honors, Awards and Special Recognition

Dean Winward

- USDA Dixie National Forest Certificate of Merit

## Professional Memberships and Community Service

Nica Clark

- Student service-learning coordinator for:
  - Iron County Share & Care
  - Iron County School District
  - Cedar City Senior Center
  - LDS Bishops Storehouse
  - Emerald Point Assisted Living Center
- Nutrition education volunteer, Guatemala
- 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
  - NACTA
- Judge or organizer for:
  - FFA events
  - Iron County Farm Field Day
  - SW Junior Livestock Show

Artis P. Grady

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

Matthew C. Schmidt

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

## Memberships & Service (continued)

Randall Violet

- Member of:
  - Society for Range Management
  - NACTA
  - NAAE
  - Western Society of Weed Science
- Fall Livestock Festival and FFA judge

Dean L. Winward

- Member of:
  - NACTA
  - Utah Farm Bureau Federation
  - Utah Weed Control Association
  - Iron County Weed Board
  - Iron County Cattleman's Assoc
- Iron County Fair judge
- Judge for SW Junior Livestock Show
- Provided Master Gardener class for region

Lee Wood

- Member of:
  - NACTA
  - Equine Science Society
  - NAEAA
  - American Society of Animal Science
  - American Quarter Horse Assoc
  - Iron County Cattleman's Assoc
- Fall Livestock Festival and FFA judge

Cynthia B. Wright

- Member of:
  - Academy of Nutrition & Dietetics
  - Society for Nutrition Education
  - AAFCS/UAFCS
  - Utah Coalition for Ed Technology
  - Healthy Iron County Coalition
- Reviewer for the *Journal of Family and Consumer Sciences*
- Judge for FFA Agriscience Fair
- Volunteer for Utah SW Public Health Department



# Department of Biology

## Mission Statement

The Department of Biology maintains a highly educated and academically, philosophically and culturally diverse faculty in order to:

1. Offer all students the opportunity to understand and use scientific thinking and techniques in the study of living things, to realize the relationships of science to other modes of thought, and to become familiar with contemporary models of biological functions and with the facts of regional ecosystems of southwest Utah and its neighbors.
2. Offer interested students the rigorous opportunity to prepare for advanced study in biology and for careers in agriculture, health care, secondary teaching and biological aspects of land management.
3. Build partnerships for service within the regional community.
4. Foster productive scholarship by students and faculty.
5. Create a collegial atmosphere and free exchange of ideas in the department.

The department provides undergraduate programs in agriculture, botany and zoology. Prescribed course work in the department supports the general education program of the University, builds a solid base for graduate or professional study, prepares public school teachers, and provides the instructional foundation necessary for careers in many fields.

## Programs and Degrees Offered

### BACHELOR DEGREES:

BA/BS Biology:

- Botany Emphasis
- Education Emphasis
- Forensic Emphasis
- Zoology Emphasis

MINOR:

Biology

## Student Learning Outcomes

- A. Students will demonstrate an understanding of general knowledge of biology: its language, history, findings and applications, including:
  1. the basic chemistry of life, DNA, RNA, proteins
  2. the processes associated with inheritance
  3. cell structure and function
  4. physiological systems and processes
- B. Students will demonstrate an understanding of the dynamics of interactions and adaptations within and among biological systems, including:
  1. population biology and the importance of organismal interactions
  2. the importance of the interaction between biotic and abiotic components of an ecosystem
  3. the diversity of living organisms and the evolutionary relationships among them
  4. evolutionary processes and their importance
- C. Students will demonstrate an understanding of the methodologies of science and will synthesize new knowledge from scientific literature; students will demonstrate their knowledge and understanding of the following:
  1. the scientific method
  2. reading, understanding, and critiquing peer-reviewed literature
- D. Students will communicate effectively in oral, written, and other formats; students will demonstrate their skills in the following areas:
  1. oral presentation of scientific work or synthesis of knowledge from the field
  2. written presentation of scientific work or synthesis of knowledge from the field
- E. Students will use appropriate tools to carry out investigations in their intended fields, including:
  1. demonstrating competency in use of appropriate field and/or laboratory equipment
  2. successful completion of an SUU-approved experiential learning activity
  3. acquiring sufficient knowledge and training to successfully enter graduate or professional school
  4. completion of an independent research project



## Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Elizabeth Bancroft	Assistant Professor	Zoology, Ecology	2010
Helen C. Boswell	Associate Professor	Evolutionary Biology	1999
James Crouch	Professional Staff	Greenhouse Specialist	1990
Fredric Govedich	Assistant Professor	Zoology, Entomology	2006
Jacqueline Grant	Assistant Professor / Museum Curator	Zoology, Botany	2012
Debra Hanson	Assistant Professor, Non-Tenure Track	Anatomy, Microbiology	2004
William Heyborne	Assistant Professor	Zoology, Herpetology	2011
Terri Hildebrand	Assistant Professor	Botany	2006
Jonathan Karpel	Assistant Professor	Cellular/Molecular Biology	2010
Paul Larson	Associate Professor, Interim Chair	Geography	1994
Ron Martin	Associate Professor	Botany	1996
Laurie Mauger	Assistant Professor	Genetics	2011
Paul Pillitteri	Associate Professor	Anatomy, Physiology	2005
Paul Spruell	Assistant Professor	Ecology	2007
John Taylor	Assistant Professor	Biology Education	2002
Mary Jo Tufte	Lecturer, Non-Tenure Track	Anatomy, Physiology	2010
Matthew Weeg	Assistant Professor	Neurobiology	2011

# Productivity Highlights 2012-2013

## Scholarly Presentations at Professional Meetings

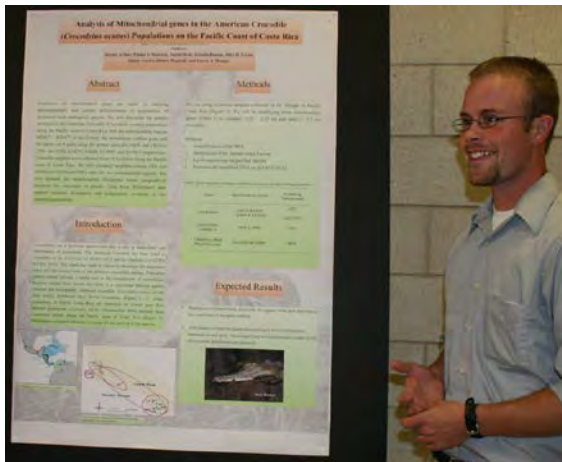
Barney M.; Keeler J.; Weeg, M.S. "Fire retardant as an environmental risk factor contributing to Parkinson's disease" *7<sup>th</sup> Annual Utah Conference on Undergraduate Research*, February 22 2013, Logan UT

Hildebrand, T; Tufte, M.J.; Manwill, P.; Kansagra, H. "Antimicrobial properties of essential oils isolated from *Anthoxanthum* species against soil bacteria", *7<sup>th</sup> Annual Utah Conference on Undergraduate Research*, February 22 2013, Logan UT

Wood, T.; Govedich, F.R.; Spruell, P. "Strength in numbers: behavioral response of speckled Dace and Virgin Spinedace to invasive crayfish" *7<sup>th</sup> Annual Utah Conference on Undergraduate Research*, February 22 2013, Logan UT

Shumway, H.; Govedich, F.R.; Bain, B.A. "Feeding strategies and prey preferences in predacious leeches" *7<sup>th</sup> Annual Utah Conference on Undergraduate Research*, February 22 2013, Logan UT

Miller, S.; Spruell, P. "Ability of Wolf Spider's (*Lycosidae*) to assess their nutritional needs and deficiencies" *7<sup>th</sup> Annual Utah Conference on Undergraduate Research*, February 22 2013, Logan UT



## Honors, Awards and Special Recognition

John Taylor

- 2013 SUU Distinguished Educator

## Scholarly Publications

Baker, N.J.; Bancroft, B.A.; Garcia, T.S. "A meta-analysis of the effects of pesticides and fertilizers on survival and growth of amphibians" *Science of the Total Environment* 449 2013, 150—156.

Blaustein, A.R.; Searle, C.L.; Bancroft, B.A.; Lawler, J.J. "Amphibian population declines and climate change". pp 29—54 in *Ecological Consequences of Climate Change: Mechanisms, Consequences, and Management*. Beever, EA and Belant, JL, eds. CRC Press 2012, Taylor and Francis Group, Boca Raton, FL, USA.

Moser, W.E.; Govedich, F.R.; Klemm, D.J. "Annelida, Hirudinea (leeches)" in: Reference Module in Earth Systems and Environmental Sciences, *Encyclopedia of Inland Waters* Elsevier 2013.

Moser, W.E.; Richardson, D.J.; Hammond, C.I.; Govedich, F.R.; Lazo-Wasem, E.A. "Resurrection and redescription of *Placobdella rugosa* (Verrill, 1874) (Hirudinida: Glossiphoniidae)" *Bulletin of the Peabody Museum of Natural History* 53 (2) 2012, 375—381.

Heyborne, W.H. "Using big box biology to teach diversity" *The American Biology Teacher* 75 (2) 2013, 133—134.

Mauger, L.A.; Velez E.; Cherkiss M.S.; Brien, M.L.; Boston, M.; Mazzotti, F.J.; Spotila, J.R. "Population assessment of the American crocodile, *Crocodylus acutus* (Crocodylia: Crocodylidae) on the Pacific coast of Costa Rica" *Revista de Biología Tropical* 60 (4) 2012, 1889—1901.

## External Grants

**Betsy Bancroft, Terri Hildebrand, Barry Baker**

- *iUTAH (NSF)* The effect of anthropogenic nitrogen and sedimentation on primary producers mediated through tadpole bioturbation, March 2013—current (\$10,000)

**Paul Spruell**

- *NSF* Hydro-sustainability August 2012—July 2013 (\$23,070)

**John Taylor**

- *CPCESU (NSF)* Bat ecology of Pipe Spring National Monument and the Kaibab Paiute Reservation. September 2010—December 2013 (\$40,000)

## Professional Memberships and Community Service

**Betsy Bancroft**

- Member of *Ecological Society of America*
- Editor or reviewer for five journals:
  - *Animals*
  - *Int Journal of Tropical Biology & Conservation*
  - *Conservation Biology*
  - *Acta Ichthyologica et Piscatoria*
  - *Copeia*
- Ad hoc reviewer for *NSF*
- Volunteer for Cedar City's Migratory Bird Day
- Volunteer for Cedar Breaks BioBlast Weekend

**Jacqueline Grant**

- Member and reviewer: *Society for Conservation Biology*
- Public school outreach

**Fred Govedich**

- Editor or reviewer for five journals:
  - *Bulletin of the Peabody Museum (Yale)*
  - *Comparative Parasitology*
  - *Functional Ecology*
  - *Southwestern Naturalist*
  - *ZooKeys*
- Volunteer for Cedar Breaks BioBlast Weekend

## Memberships & Service (continued)

**William Heyborne**

- Member and reviewer: *National Association of Biology Teachers*
- Member of:
  - *American Malacological Society*
  - *Entomological Society of America*
  - *Society for the Study of Amphibians and Reptiles*
- Public school outreach

**Jon Karpel**

- Reviewer for publisher *Wiley*
- Public school outreach
- Volunteer for AYSO soccer

**Laurie Mauger**

- Member of:
  - *Ecological Society of America*
  - *Evolution Society*
  - *Society of Women Environmental Professionals*

**Paul Spruell**

- Volunteer for USFS Selway River Patrol
- Reviewer for:
  - *Molecular Ecology*
  - *Molecular Phylogenetics and Evolution*
  - *North American Journal of Fisheries Management*
  - *Animal Conservation*
  - *Transactions of the American Fisheries Society*

**John Taylor**

- Public school and NPS outreach
- BSA volunteer
- Board Member of:
  - *Utah Science Teachers Association*
  - *Zion Canyon Field Institute*
  - *Zion Natural History Association*

**Mary Jo Tufte**

- Member *Human Anatomy & Physiology Society*

**Matthew Weeg**

- Public school outreach

# 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 CSIS 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 Computer Science, Forensic Science Emphasis  
BS Information Systems

### ASSOCIATE of APPLIED SCIENCE

Information Technology  
Networking/Telecomm Emphasis  
CS and IS Security Emphasis

### MINOR:

Computer Science  
Computer Science, Forensic Science  
Information Systems

## 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.

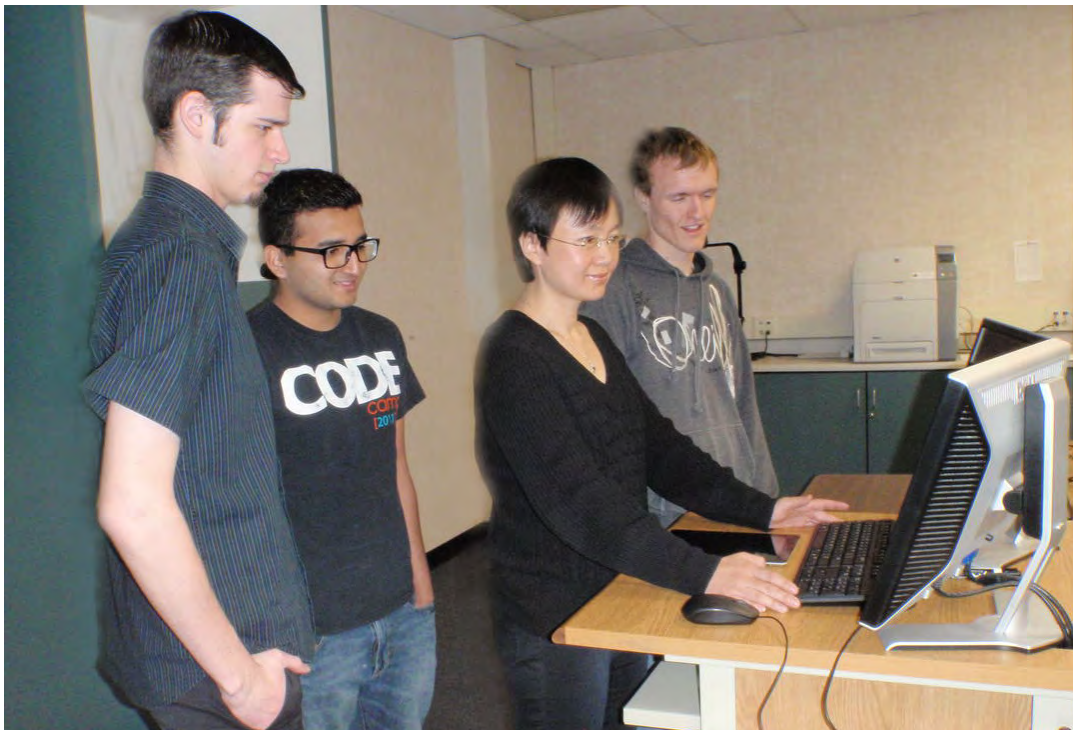


The Computer Science and Information Systems degrees at Southern Utah University are ABET accredited.



## Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Nathan Barker	Assistant Professor	Bioinformatics, Data Mining	2007
Michael Grady	Associate Professor	Algorithms, Computational Mathematics	2001
Cecily Heiner	Assistant Professor	AI, Machine Learning	2011
Shalini Kesar	Assistant Professor	E-commerce, Information Security	2007
Laurie Harris	Lecturer, Non-Tenure Track	Computer Literacy	2011
Connie Nyman	Associate Professor	Computer Education	1970
Rob 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 2012-13

### Scholarly Presentations at Professional Meetings

Barker, N.; Nyman, C. "Adaptive curriculum in a computer literacy course" *Frontiers in Education: Computer Science and Computer Engineering* July 19 2012, Las Vegas NV

Barker, N.; Harris, L.; Nyman, C. "A comparison of student performance: traditional versus on-line in a skills based computer applications course" *American Association of Behavioral and Social Sciences*, February 2013, Las Vegas NV

Grady, M. "Gelman's subgroup counting theorem" *26<sup>th</sup> Annual Midwest Conference on Combinatorics, Cryptography and Computing*, October 13 2012, Cedar City UT

Kesar, S. "How do we decide what is right: using triple-loop learning in context of management of computer crime" *Ethicomp 2013*, June 2013, Kolding Denmark

Kesar, S. "Rethinking education: STEM becomes a STEAM project" *Ethicomp 2013*, June 2013, Kolding Denmark

Kesar, S. "The STEAM project" *American Association of Behavioral and Social Sciences*, February 2013, Las Vegas NV

Wu, D. "IT professionals' time management strategies for value-added knowledge creation in projects" *Northeast Decision Science Institute 2013 Annual Conference*, April 2013, New York NY

Wu, D. "Time management quality and temporal structure usage in calendar systems" *International Conference on Information Systems (ICIS 2012) SIG Cognitive Research Workshop*, December 2012, Orlando FL

Wu, D. "Fostering professional learning communities through knowledge sharing: the role of user-centeredness and school website usability" *International Conference on Information Systems (ICIS 2012) SIG Cognitive Research Workshop*, December 2012, Orlando FL

### Scholarly Presentations (continued)

Wu, D. "M-learning on iPad: an exploration of user learning experiences on road safety" *International Conference on Information Systems (ICIS 2012) SIG Cognitive Research Workshop*, December 2012, Orlando FL

Wu, D. "Virtual labs: experiencing internet-based 3D spatial training" *International Conference on Information Systems (ICIS 2012) SIG Cognitive Research Workshop*, December 2012, Orlando FL

Wu, D. "Understanding learners' social and psychological needs in a mobile learning environment" *International Conference on Information Systems (ICIS 2012) SIG Cognitive Research Workshop*, December 2012, Orlando FL

### Scholarly Publications

Wu, D. "Temporal Knowledge: Understanding Time Management through Knowledge Management Lens" *Journal of Information Science and Technology* 8 (2) 2012, 17—34.



## Professional Memberships and Community Service

### Nathan Barker

- Sterling Scholar Judge
- Member: *Association for Computing Machinery*

### Michael Grady

- Member of:
  - *Association for Computing Machinery*
  - *Mathematical Association of America*
  - *CCSC Rocky Mountain*

### Cecily Heiner

- Volunteer work for NCWIT Aspirations Award
- Member of:
  - *Artificial Intelligence in Education Society*
  - *Computer Science Teachers Association*
  - *International Educational Data Mining Society*

### 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 2014*
- Volunteer work for NCWIT Aspirations Award
- Member of:
  - *Association for Computing Machinery*
  - *Association of Information Systems*
  - *Computer Science Teachers Association*
  - *Special Interest Group in EGovernment*
  - *Special Interest Group in IS Security*
  - *National Center for Women and IT*

### Laurie Harris

- Member of:
  - *Association for Career & Technical Education*
  - *National Business Education Association*

### Connie Nyman

- Volunteer for Utah Summer Games
- Member of:
  - *National Business Education Association*
  - *Western Business and IT Educators*
  - *Utah Business and Comp Ed Association*
  - *Association for Career and Tech Ed*
  - *Phi Kappa Phi*

## Memberships & Service (continued)

### Nasser Tadayon

- Member: *Association of Computing Machinery*
- Volunteer work for NCWIT Aspirations Award

### Dezhi Wu

- Co-chair for *AMCIS 2013* mini-track session
- Member of:
  - *Association of Computing Machinery*
  - *Association for Information Systems*
  - *Project Management Institute*
  - *ICIS 2012 HCI workshop program*
- Reviewer for:
  - *AMCIS 2013*
  - *Decision Sciences*
  - *ECIS 2013*
  - *Information Systems Frontiers*
  - *International Journal of Human Computer Studies*



# 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, inventors, and entrepreneurs.

## Programs and Degrees Offered

### BACHELOR DEGREES

BA/BS in:

Construction Management

Engineering Technology

Arch/Civil Design Emphasis

CAD/CAM Emphasis

CAD/GIS Emphasis

EET Emphasis

### ASSOCIATE OF APPLIED SCIENCE

Construction Technology

CAD/CAM Technology

Electronics Technology

### 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 Borisova	Lecturer, Non-Tenure Track	Electronics and Computer Technology	2011
Richard Cozzens	Professional in Residence, Non-Tenure Track	2D and 3D Design	2001
Matt Edwards	Professional in residence, Non-Tenure Track	Construction Technology	2007
Boyd Fife	Assistant Professor	Construction Management	1993
Roger Greener	Professional Staff	Computer Aided Manufacturing (CAM)	1990
L. Scott Hansen	Associate Professor, Chair	Technology Education	2007
Dave Ward	Associate Professor	Electronics Technology	1985



# Productivity Highlights 2012-13

## Scholarly Presentations at Professional Meetings

Borisova, I.; Cozzens, R.; Farner, J.; Paskett, T.; Perez, E. "Development of an open-source concurrent enrollment course that introduces students to the Engineering Design and Documentation Process" *120<sup>th</sup> ASEE Annual Conference and Exposition*, June 2013, Atlanta GA

Borisova, I.; Cozzens, R.; Kesar, S. "Bringing creativity into the classroom via technology: Using tech as a pedagogical tool" *American Association of Behavioral and Social Sciences*, February 2013, Las Vegas NV

Cozzens, R. "Developing robust CAD curriculum by applying blended learning environment & technology" *Ethicomp 2013*, June 2013, Kolding Denmark

## Documents, Books, and other Publications

Cozzens, R. "Autodesk Inventor 2014 Workbook" *SDC Publications*; September 2013, ISBN 978-1-58503-831-2

Edwards, M. Instruction manual for *Modern Arch Structures* (whitepaper, internal document)

Hansen, L. S. "Autodesk Inventor 2014: A Tutorial Introduction", *SDC Publications* April 2013, ISBN 978-1-58503-821-3

## External Grants

Richard Cozzens (PI) with Shalini Kesar, Isabella Borisova

- USHE/USOE *Technology Intensive Concurrent Enrollment (TICE)* grant, July 2012—December 2013 (\$1,875,000)

Dave Ward (PI), et al

- Carl D. Perkins Career and Technical Education* grant, July 2012—June 2013 (\$98,373)

## Professional Memberships and Community Service

Isabella Borisova

- Member of :
  - *American Society for Engineering Education*
  - *Utah CTE (Electronics Division President)*

Richard Cozzens

- Member of :
  - *American Society for Engineering Education*
  - *CATIA Higher Education and Training*
  - *Advisory Board for Design Graphics (WSU)*

Matt Edwards

- Volunteer for *Iron County Homebuilders Association*
- Member of:
  - *Association of Concrete Industries*
  - *National Association of Home Builders*

Boyd Fife

- Chairman for local Red Cross Blood Drive
- Member of:
  - *Educational Advisory Board for Iron County Homebuilders Association*
  - *SWATC Advisory Board*
  - *Dixie ATC Building Trades Board*

Dave Ward

- Director of Career and Technical Education (SUU)



# 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  
BS Integrated Engineering

ASSOCIATE DEGREES  
Pre-Engineering

## Special Accreditation



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



## 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.



## Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Roger Greener	Professional Staff	Computer Aided Manufacturing (CAM)	1990
Glen Longhurst	Associate Professor, Chair	Nuclear Engineering	2009
Thad Morton	Assistant Professor	Fluid Dynamics	2009
John Murray	Associate Professor	Mechanical Engineering, Sustainable Design	2007
Desmond Penny	Professor	Civil Engineering	1983

## Productivity Highlights 2012-13

### Scholarly Presentations at Professional Meetings

Longhurst, G.R. "Measuring the Permeability of Hydrogen in Metals" *4<sup>th</sup> North American Materials Education Symposium*, March 2013, Philadelphia, PA

Longhurst, G.R. "History of the Beryllium Technology Workshop Series" *10<sup>th</sup> IEA Workshop on Beryllium Technology*, September 2012, Karlsruhe, Germany

Murray, J. "DesignBuildBLUFF: Coyote Architecture on the Colorado Plateau" *AAAS 94<sup>th</sup> Annual Meeting of the Pacific Division*, June 2013, Las Vegas NV

### Scholarly Publications

Clayton, K. K.; Longhurst, G. R.; Luscher, W. G.; Senor, D. J. "In situ measurement of tritium permeation through stainless steel" *Journal of Nuclear Materials* 2013 437 373—379.

### Professional Memberships and Community Service

#### Glen Longhurst

- Renewable Energy Fair judge
- Member of
  - *American Society for Engineering Education*
  - *Tech Up Southern Utah*
  - *Southwest Utah Renewable Energy Center Steering Committee*

#### John Murray

- Member of the *American Association for the Advancement of Science*

#### Thad Morton

- Member of the *American Society for Engineering Education*

#### Des Penny

- Member of the *American Society for Engineering Education*



# Department of Mathematics

## Mission Statement

Our mission is to promote research in mathematics, mathematics education, bioinformatics, and statistics among undergraduate students. Research collaboration with faculty prepares students to be better educators and scholars and also prepares them for graduate school and employment in industry. Through undergraduate research, students learn teamwork, discipline, writing and presentation skills, creativity, and problem solving.

## 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

## 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





## Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Matthew Adams	Lecturer, Non-Tenure Track	Math Literacy	2012
Seth Armstrong	Associate Professor, Chair	Partial Differential Equations	2001
Said Bahi	Associate Professor	Operations Research	2001
James Brandt	Assistant Professor	History of Math, Math Education	2006
Sarah Duffin	Associate Professor	Partial Differential Equations	2004
Eric Freden	Associate Professor, Interim Associate Dean	Geometric Group Theory	1997
Jianlong Han	Associate Professor	Partial Differential Equations	2005
Derek Hein	Associate Professor	Combinatorial Design Theory	2004
Marty Larkin	Associate Professor	Math Education	1989
Jana Lunt	Assistant Professor	Math Education	2010
Mark Meilstrup	Assistant Professor	Geometric Group Theory	2011
Gretchen Rimmasch	Assistant Professor	Tropical Algebra	2008
Emma Turner	Lecturer, Non-Tenure Track	Finite Group Theory	2012
Andreas Weingartner	Associate Professor	Number Theory, Actuarial Science	1999
Cecilia Weingartner	Lecturer, Non-Tenure Track	Numerical Methods	2008
Chunlei Zhang	Assistant Professor	Partial Differential Equations	2006

# Productivity Highlights 2012-13

## Scholarly Presentations at Professional Meetings

Armstrong, S. "Numerical analysis of a Lotka-Volterra system with diffusion" *MAA Intermountain Section Meeting*, April 2013, Rexburg ID

Bahi, S. "Determinant of Service Quality in Higher Ed" *IABE-2013 Winter Meeting*, April 2013, Orlando FL

Han, J. "A method for numerical analysis of a Lotka-Volterra food web model", *International Conference on Mathematical Modeling, Analysis and Computation*, July 2012, Xiamen, China

Han, J. "A nonlocal evolution equation" *MAA Intermountain Section Meeting*; April 2013, Rexburg ID

Hein, D. "Stanton-type decompositions of  $\lambda K_n$ ", *26<sup>th</sup> Midwest Conference on Combinatorics, Cryptography and Computing*, October 2012, Cedar City UT

Hein, D. "Decompositions of  $\lambda K_n$  on Stanton-type graphs: a small case", *MAA Intermountain Section Meeting*; April 2013, Rexburg ID

Lunt, J. "The story of mathematics: using definitions in teaching", *International Institute for SoTL Scholars and Mentors*, June 2013, Los Angeles, CA

## External Grants

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

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

## Scholarly Publications

Armstrong, S.; Han, J. "A method for numerical analysis of a Lotka-Volterra food web model" *International Journal of Numerical Analysis and Modeling B*, 3 (3) 2012, 442—459

Bahi, S "Determinant of service quality in higher education: underlying structure of students and teachers perceptions" *European Journal of Management* 13 (1) 2013 (electronic article).

Bahi, S.; Ross, A. "An algorithm for finding nonnegative minimal norm solutions of linear systems" *International Journal of Numerical Analysis and Modeling*. 10 (3) 2013, 745—755.

Brandt, J "Classroom activities for introducing equivalence relations", *PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies* 23 (2) 2013, 150—160.

Conner, G.; Meilstrup, M. "Deforestation of Peano continua and minimal deformation retracts" *Topology and its Applications* 159 (15) 2012, 3253—3262.

Conner, G; Meilstrup, M. "Arc-reduced forms for Peano continua" *Topology and its Applications* 159 (16) 2012, 3538—3543.

Cannon, J. W.; Meilstrup, M.; Zastrow, A. "The period set of a map from the Cantor set to itself" *Discrete and Continuous Dynamical Systems-A*, 33 (7) 2013, 2667—2679.

Weingartner, A. "On the Diophantine equation  $\prod x_i = \sum x_i$ " *Integers* 12 2012 (electronic article A57).

Baker, R. C.; Banks, W. D.; Brüdern, J.; Shparlinski, I. E.; Weingartner, A. "Piatetski-Shapiro Sequences" *Acta Arithmetica* 157 (1) 2013, 37—68.

## Professional Memberships and Community Service

### Jim Brandt

- Member of *Mathematical Association of America*

### Sarah Duffin

- *Canyon View Science Fair Judge*

### Eric Freden

- Member of the *American Mathematical Society*
- Member of the *Parowan Shade Tree Commission*

### Jianlong Han

- Member of the *American Mathematical Society*

### Derek Hein

- *AP Calculus reader*
- *Sterling Scholar Judge*
- Member of:
  - *American Mathematical Society*
  - *Mathematical Association of America*
  - *Institute for Combinatorics and its Applications*

### Marty Larkin

- Volunteer for *Utah Summer Games*
- Volunteer for *Utah Shakespeare Festival*
- Member of
  - *American Mathematical Society*
  - *Mathematical Association of America*
  - *National Council of Teachers of Mathematics*
  - *Utah Council of Teachers of Mathematics*
  - *Association of Mathematics Teacher Educators*
  - *Utah Association of Mathematics Teacher Educators*

### Jana Lunt

- Member of
  - *Psychology of Mathematics Education NA*
  - *Mathematical Association of America*
  - *National Council of Teachers of Mathematics*
  - *Association of Mathematics Teacher Educators*
  - *Utah Association of Mathematics Teacher Educators*

### Mark Meilstrup

- Member of the *American Mathematical Society*

### Gretchen Rimmasch

- Member: *Mathematical Association of America*

### Emma Turner

- Member: *Mathematical Association of America*

### Andreas 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
Aja James	Assistant Professor, Non-Tenure Track	EMT, ICU	2007
Claudia Kreipl	Assistant Professor, Non-Tenure Track	Nursing Education	2009
Elizabeth 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
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
Kevin D. Tipton	Assistant Professor, Non-Tenure Track	Geriatric Nursing	2006
Janet Warner	Assistant Professor, Non-Tenure Track	Maternal/Newborn Nursing	2004

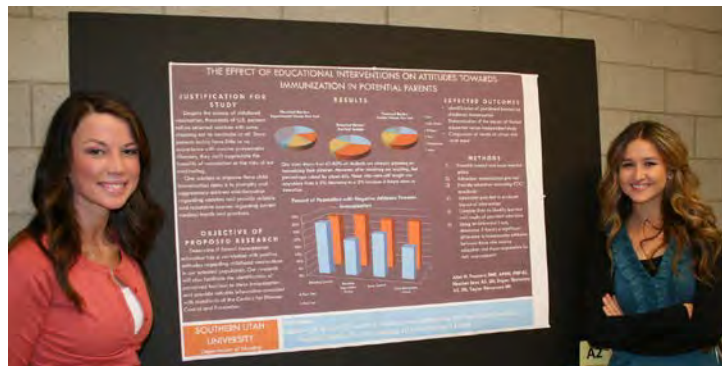
## Productivity Highlights 2012-13

### Scholarly Presentations at Professional Meetings

James, A. "Flight Nursing" *Utah Student Nurses Association (USNA) Conference*, February 2013, Sandy UT

Rasmusson, R.S.; Sanderson, S. "Using Popular Culture as a Teaching Strategy to Promote Critical thinking" *39<sup>th</sup> Annual National Conference on Professional Nursing Education and Development*, October 2012, Philadelphia PA

Pearson, A. "Achieving outcomes embracing constructivist development theory" *13<sup>th</sup> Annual Nurse Educator Institute*, April 2013, Branson MO





## Professional Memberships and Community Service

### Aja James

- Member of:
  - *Air and Surface Transport Nurses Association*
  - *American Critical Care Nurses*
  - *Emergency Nurses Association*
  - *National League of Nursing*

### Claudia Kreipl

- Member of:
  - *National League of Nursing*
  - *Nurse Healers Associates International*
  - *Therapeutic Touch*
  - *Utah Nurse's Association*
  - *UpLedge Institute*
- Volunteer for:
  - *St. George Marathon*
  - *St. George Iron Man*
  - *St. George Free Clinic*

### Selwyn Layton

- President of *Valley View Emergency Department Chapter*
- Member of:
  - *American Association of Critical Care Nursing*
  - *American Nurses Association*
  - *Emergency Nurses Association*
  - *National League of Nursing*
  - *Utah Nurses Association*
- Volunteer for *Utah Summer Games*

### Donna Lister

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

## Memberships & Service (continued)

### Alan Pearson

- Member of:
  - *American Association of Nurse Practitioners*
  - *National League of Nursing*
  - *Valley View Medical Staff Association*
- Volunteer for:
  - *American Red Cross Blood Drive*
  - *Hispanic Health Fair Health Screening*
  - *Huntsman Senior World Games*
- Public school outreach

### Rebecca Rasmusson

- Member of:
  - *Beaver Valley Hospital Medical Staff Association*
  - *National League of Nursing*
- Health Promotion Community Teaching volunteer

### Shelly Sanderson

- Member *National League of Nursing*

### Kevin 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*

### Janet Warner

- Member of:
  - *American Nurses Association*
  - *Arthritis Foundation*
  - *National League of Nursing*
  - *Utah Nurses Association*

# Department of Physical Science

## Mission Statement

The multidisciplinary Department of Physical Science at Southern Utah University offers undergraduate programs in Chemistry, Geosciences, Geographic Information Systems, and Physics. Our dedicated and highly qualified faculty represent numerous disciplines, offering students expertise in the classroom and a wide variety of undergraduate research opportunities. A low student to faculty ratio guarantees a close working relationship between students and their professors, especially in upper division classes.

## 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	Chemistry	1997
James C. Chisholm	Assistant Professor	Physics/Cosmology	2007
Mark D. Colberg	Associate Professor	Metamorphic Petrology	2001
Daniel J. Eves	Assistant Professor	Bio-analytical Chemistry	2009
Robert L. Eves	Professor, Dean	Geochemistry	1988
Nathan Hanson	Lecturer, Non-Tenure Track	Physics/Astronomy	2011
Jennifer Hargrave	Assistant Professor	Paleontology	2011
Bruce R. Howard	Associate Professor	Biochemistry	2002
Paul R. Larson	Associate Professor	Geography	1994
C. Frederick Lohrengel II	Professor (Emeritus)	Micro-paleontology	1986
John MacLean	Assistant Professor	Structural Geology	2010
David Maxwell	Professional Staff	GIS	1997
Amber McConnell	Assistant Professor	Physical Chemistry	2012
Christopher Monson	Assistant Professor	Analytical Chemistry	2011
Radhika Nair	Assistant Professor	Inorganic Chemistry	2010
J. Ty Redd	Professor, Interim Chair	Organic Chemistry	1990
Hussein A. Samha	Associate Professor	Inorganic Chemistry	2001
Brent A. Sorensen	Associate Professor	Physics/Astronomy	1983
Mackay B. Steffensen	Assistant Professor	Organic Chemistry	2006
Kim H. Weaver	Associate Professor	Analytical Chemistry	2000
Nathan Werner	Assistant Professor	Organic Chemistry	2012

# Productivity Highlights 2012-13

## Scholarly Presentations at Professional Meetings

Chisholm, J.R. "Dynamics of primordial black hole clusters", *Annual Meeting of the Four Corners Section of the American Physical Society*, October 2012, Socorro NM

Hargrave, J.E. "Can birds be used as a proxy to determine paleoclimatic conditions?" *Utah Friends of Paleontology State Meeting*, April 6 2013, St George UT

Cleveland, C.E.; Hildebrand, T.; Hargrave, J.E.; MacLean, J. "Tufa insights into late Quaternary paleoenvironment of northwestern Arizona" *7<sup>th</sup> Annual Utah Conference on Undergraduate Research*, February 22 2013, Logan UT

Larson, P.R.; Lohrengel, C.F.; Covington, R.L.; Elder, J.R. "Climate map for Utah" *2013 Annual Meeting of the Association of American Geographers*, April 12 2013, Los Angeles, CA

MacLean, J.S. "Geology field camp in southern Utah's National Parks" *2012 Geological Society of America Annual Meeting & Exposition*, November 7 2012, Charlotte NC

MacLean, J.S.; White, B.J. "Honors and the National Parks: assessing the academic rigor of Experiential Education" *National Collegiate Honors Council Annual Conference*, November 2012, Boston MA

Samha, H. "Study of the chemical environment inside free volume holes in halogenated styrene polymers using positron annihilation spectroscopy" *245<sup>th</sup> American Chemical Society National Meeting & Exposition*, April 2013, New Orleans, LA

## Documents, Books, and other Publications

Rowley, P.D.; Rutledge, E.F.; Maxwell, D.J.; Dixon, G.L.; Wallace, C.A. "Geologic map of the Sulphurdale geothermal-resource area, Beaver and Millard counties, Utah" *Open-File Report 609, Utah Geological Survey*, 2013 (CDROM)

## External Grants

David Maxwell, Bridget Eastep

- CPCEU Zion and Bryce Canyon NP Archeological GIS support, 2011—2013 (\$48,000)
- Forest Service (USDA) ALP to CadNSDI GIS Conflation Project, Spring 2013—Fall 2013 (\$48,127)

Radhika Nair

- Western Alliance to Expand Student Opportunities for Summer 2013 undergraduate research (\$756)

## Scholarly Publications

Lohrengel, C.F.; Larson, P.R. "Determining atmospheric pressure using a water barometer." *The Physics Teacher*, 50 2012, 563—565.

McConnell, A.C.; Shurdha, E.; Bell, J.D.; Miller, J.S. "Antiferromagnetic ordering of  $M^{II}(\text{TCNE})[\text{C}_4(\text{CN})_8]_{1/2}$  ( $M=\text{Mn, Fe}$ ; TCNE=Tetracyanoethylene)" *Journal of Physical Chemistry C*, 116 (35) 2012, 18952—18957.

McConnell, A.C.; Bell, J.D.; Miller, J.S. "Pressure-induced transition from an antiferromagnet to a ferrimagnet for  $\text{Mn}^{II}(\text{TCNE})[\text{C}_4(\text{CN})_8]_{1/2}$  (TCNE=Tetracyanoethylene)" *Inorganic Chemistry*, 51 (18) 2012, 9978—9982.

DaSilva, J.G.; McConnell, A.C.; Fishman, R.S.; Miller, J.S. "A mean-field analysis of the exchange coupling ( $J$ ) for noncubic Prussian Blue analogue magnets" *Journal of Physical Chemistry C*, 116 (46) 2012, 24752—24756.

DaSilva, J.G.; McConnell, A.C.; Miller, J.S. "Pressure-dependent reversible increase in  $T_c$  for the ferrimagnetic 2-D  $\text{Mn}^{II}(\text{TCNE})\text{I}(\text{OH}_2)$  and 3-D  $\text{Mn}^{II}(\text{TCNE})_{3/2}(\text{I}_3)_{1/2} \cdot z\text{THF}$  organic-based magnets" *Inorganic Chemistry*, 52 (8) 2013, 4629—4634.

Monson, C.F.; Cong, X.; Robison, A.D.; Pace, H.P.; Liu, C.; Poynton, M.F.; Cremer, P.S. "Phosphatidylserine reversibly binds  $\text{Cu}^{2+}$  with extremely high affinity" *J. Am. Chem. Soc.*, 134 (18) 2012, 7773—7779.

## Professional Memberships and Community Service

### Jim Chisholm

- Member of American Physical Society

### Daniel Eves

- Sterling Scholar Judge

### Jennifer Hargrave

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

### Bruce Howard

- Member of:
  - *American Association for the Advancement of Science*
  - *American Chemical Society*

### Paul Larson

- Member of:
  - *Association of American Geographers*
  - *National Council for Geographic Education*
  - *National Geographic Society*
  - Board of Directors, *Iron County Historical Society*
  - Editorial Board, *Iron County Journal*
- Sterling Scholar Judge
- Textbook advisor for publisher *McGraw-Hill*

### John 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

### Dave Maxwell

- Member of:
  - *Utah Geographic Information Council*
  - *Five Counties GIS User Group*
  - *Southern Utah Technology Council*
- Beaver 30x60 Quadrangle Revisions of 1:24k Geology Map, UGS, Spring-Summer 2013
- Brian Head Master Trails Mapping Project, Spring 2013

### Dave Maxwell (continued)

- Cave Canyon Quadrangle Revisions of 1:24k Geology Map, Spring-Summer 2013
- Iron County Parcels Data Management, Spring-Summer 2013
- Milford City GIS Support for Utility Infrastructure, Fall-2012, Spring-Summer 2013
- GIS Support for National Parks Trials I-phone Application, Spring-Summer 2013
- Mapping LDS ward boundaries

### Amber McConnell

- Member *American Chemical Society*
- Reviewer for *Journal of Physical Chemistry Letters*

### Chris Monson

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

### Radhika Nair

- Member of:
  - *American Chemical Society*
  - *Phi Beta Kappa Honor Society*
- Reviewer for the *Journal of Student Research*
- Reviewer for *WAESO* Summer 2013 undergraduate projects
- Public school outreach

### Mackay Steffensen

- Member *American Chemical Society*
- Public school outreach

### J. Ty Redd

- Member *American Chemical Society*

### Hussein Samha

- Textbook evaluator for publisher *John Wiley & Sons*
- Reviewer for *WAESO* Spring 2013 undergraduate projects
- Public school outreach

### Brent Sorensen

- Public star parties

### Nathan Werner

- Member *American Chemical Society*



## Professional Consulting

### Jim Chisholm

- Physics Tuning Project Phase II, Lumina Foundation, August 2012—May 2013, (\$1000)

### David Maxwell

- Iron County Addressing Project, August—December 2012; (\$5000)
- TES research *Penstemon franklinii*, Fall 2012; (\$100)
- Black Mountain Geology Mapping, GIS Basemap Support, March 2013; (\$500)

### J. Ty Redd

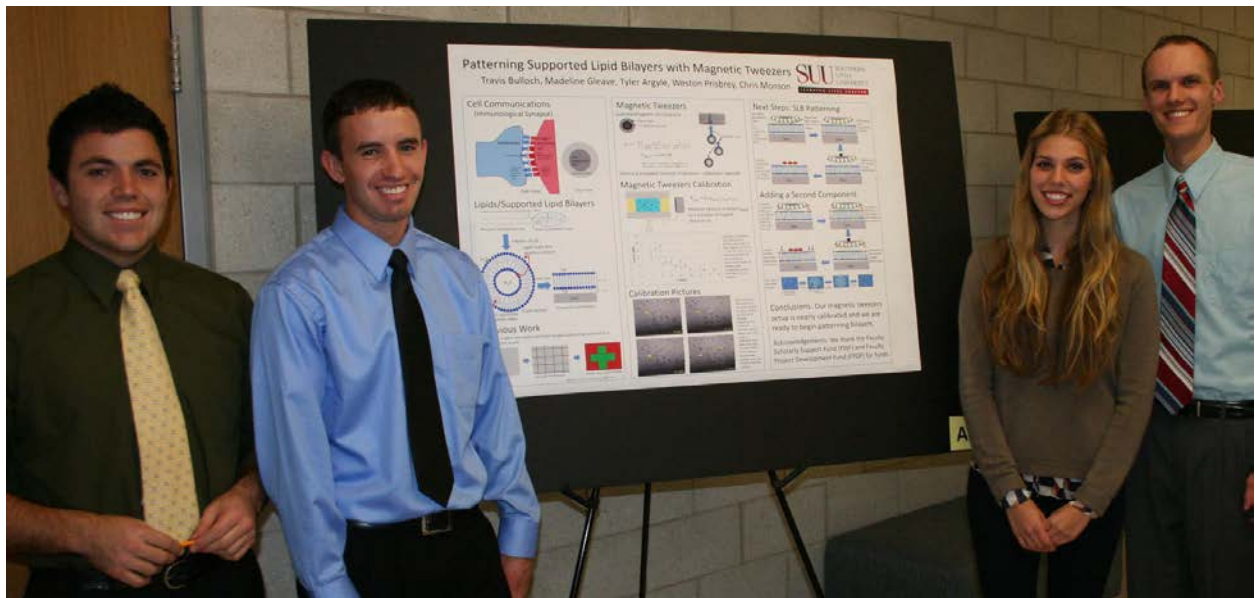
- Altius Test Prep: MCAT Test Preparation and Test Reviewer, July 2012—August 2013, (\$4,800)

### Mackay Steffensen

- Instructor for the Rural Health Scholar professional exam preparation course, Spring 2013 (\$200)

### Kim Weaver

- Analytical Services, to *XECO Corporation* for their quality control in making circuit boards (\$1350)





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College of Science & Engineering