

2013-  
2014

# Walter Maxwell Gibson College of Science and Engineering Annual Report



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## EXECUTIVE SUMMARY 2013-2014

### Summer 2014

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 accolades from the University this year. Elizabeth A. (Betsy) Bancroft, Assistant Professor of Biology, received the SUU Outstanding Educator award. Dezhi Wu, Associate Professor of Information Systems, earned the SUU Outstanding Scholar award. William H. (Bill) Heyborne, Assistant Professor of Biology was voted the 2013 SUU Thunderbird Professor of the Year.
2. Our healthcare professional acceptance successes were particularly strong this year. Data for the 2013-24 academic year, shows that 93% of WMG COSE applicants were accepted to medical school (and decisions were rendered by February 2014); 86% of dental school applicants were successful; 100% of WMG COSE graduates who applied for optometry admissions were accepted. 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 97.4% for this academic year which compares favorably with the national rate of 85.5%. 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 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 10<sup>th</sup> year of the Southern Utah Center for Computing, Engineering, and Science Students (SUCCESS) Academy partnership with SUU. Of the 100 graduates, 87 earned SUU Associate of Science degrees in 2014 while completing their high school diplomas. School-wide, SUCCESS Academy at SUU earned 5220 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 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 over 5000 4<sup>th</sup>-6<sup>th</sup> students in the last fifteen years. This summer Professor Wittwer and her staff conducted nine separate camp sessions and served 381 elementary students from 67 different regional towns, with 356 others turned away for lack of space. Additionally, the 4<sup>th</sup> annual *Camp Extreme* engaged 46 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, Glen R. Longhurst, John S. MacLean and Fredric R. Govedich. There were seven new S-STEM scholarships awarded in 2013-2014 along with 13 continuations from 2012-2013.
  - A State of Utah *Technology Intensive Concurrent Enrollment (TICE)* award of \$114,000 to create online learning modules to teach computer aided design was presented to Richard Cozzens, *et al.*
  - Other grants are listed in the department summaries.
9. The *Fifth Annual WMG COSE Undergraduate Research Symposium* was held on November 18, 2013 in the Hunter Conference Center. Presentations included in-progress and more complete research presentations by students and faculty. Inter-departmental collaborative presentations were particularly encouraged. There were 43 poster and 30 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 2013-14, 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/>)
  - 11<sup>th</sup> 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>)
  - High School Interactive Experiences (<http://suu.edu/cose/hsie/>)
11. This has been another productive year for College faculty. For the 2013-2014 academic year, the following data were reported:
  - Refereed Scholarly Publications – 18
  - Refereed Presentations at Professional Meetings – 46
  - Books and other documents authored – 4
  - Funded Grants – 18
  - Special Recognitions and Awards – 2
12. Beginning 1 July 2014, six of our faculty obtained tenure and promotion to Associate Professor: Nathan A. Barker, James C. Chisholm, Shalini Kesar, John M. Murray, Paul Spruell, and John R. Taylor. We note the retirements or resignations of ten WMG COSE faculty/staff and acknowledge their efforts on behalf of the College: James C. Chisholm, James M. Crouch, Boyd E. Fife, Terri J. Hildibrand, Martha Ann “Marty” Larkin, Andrzej M. Lenard, Glen R. Longhurst, Radhika P. Nair, Desmond N. Penny, and Janet E. Warner.

## MESSAGE FROM THE DEAN



It is with sadness that we note the passing of a true legend among SUU faculty. Dr. James Emerson Bowns joined the faculty of College of Southern Utah (one of SUU's previous names) in 1965. He taught courses in agriculture, range management, and forestry throughout his 40+ year career. Possessed of a gentle spirit and a winning smile, he was beloved by SUU faculty and students. Nearly every time I speak with biology and agriculture alumni, they ask about Dr. Bowns (I never felt worthy to call him anything but that, either). Dr. Bowns was also involved in extension activities through Utah State University, and much respected by regional ranchers and agriculture professionals for his no nonsense, common sense solutions to their challenges. He served on numerous advisory committees including the Utah Department of Natural Resources, the Bureau of Land Management, and Bryce Canyon Natural History Association. His significant influence survives him, but we will surely miss the opportunity to spend time in the company of this great man (see the back cover of this document for a photo).

This academic year initiates a "season of change" for the Walter Maxwell Gibson College of Science and Engineering. As was noted in the executive summary, six faculty members with 118 years of combined service retired this year. The College is so grateful for the contributions of these outstanding faculty members and the thousands of student's lives that have been influenced by their efforts. We will miss these friends and the opportunity to rub shoulders with them daily. However, I want to assure the reader that we have exercised due diligence and have already secured the services of outstanding new faculty members to continue the legacy of service of our retirees and we look forward to the opportunity of working closely with these individuals.

Amid all of the personnel changes (and there are many more than these six retirees), I want to assure our alumni that the vision, mission, and core values of the WMG COSE have not changed. We will continue to provide outstanding instruction using highly qualified faculty members, and take time to become personally acquainted with, and involved in, the lives of our students. We know our students by name, and seek to engage them outside the formal classroom setting. Our graduate placement rates exceed the national average, our Nursing licensure pass rates are consistently above state and national averages, and our 20 year healthcare acceptance rates are some of the best in the region. SUU and the WMG COSE continues to be an academic haven, and a place you can send your children and grandchildren with confidence and pride.

The 2013-14 SUU Valedictorian was Kori Ann Corbridge, a mathematics education major from Glendale, Utah. We are so proud of Kori Ann and what she has accomplished at SUU. Like a proud parent, I can't help but point out the frequency with which WMG COSE seniors are considered and selected for this honor. We are privileged to work with outstanding young people at this institution.

As we conclude another outstanding year, and I reflect on the accomplishments of the WMG COSE, I gratefully acknowledge the contributions of our outstanding students, committed faculty, and tireless staff. It is a pleasure to work with such consummate professionals. It is their efforts that make SUU a great university.

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:

- 93% acceptance to medical schools
- 86% acceptance to dental schools
- 100% acceptance to optometry programs

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 2013-14, the following were reported:

- Educational Testing Service (ETS) Major Field Exams
  - Chemistry—70<sup>th</sup> percentile student average
  - Biology—40<sup>th</sup> percentile student average
  - Computer Science—77<sup>th</sup> percentile student average
- American Chemical Society (ACS) end-of-course exams
  - Average for all Summer 2013 sections: 76<sup>th</sup> percentile
  - Average for all Fall 2013 sections: 70<sup>th</sup> percentile
  - Average for all Spring 2014 sections: 73<sup>rd</sup> percentile
- NCLEX national standardized nursing licensure exam
  - 95% pass rate for Fall 2013
  - 100% pass rate for Spring 2014

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 2013-14

- 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 5<sup>th</sup> 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 2013-14

- A new Nuclear Magnetic Resonance (NMR) was purchased for use in chemistry classes

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 2013-14.
- 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.
- Cedar Mountain Science Camp served 381 students 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

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 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 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 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
Matthew C. Schmidt	Associate Professor	Human Nutrition	2001
Randall D. 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 2013-14

## Scholarly Presentations at Professional Meetings

**Schmidt, M.**; Moore, R.; Bryslan, N. "The Effect of Education on Hydration Status of Female Collegiate Gymnasts at Southern Utah University", *Food & Nutrition Conference & Expo*, October 22 2013, Houston TX

**Schmidt, M.**; Christiansen, S.; Fausett, S.; Acker, D; Gose, N. "A Comparison of Elementary School Lunch between the United States and Japan", *Food & Nutrition Conference & Expo*, October 22 2013, Houston TX

**Schmidt, M.**; Woolstenhulme, M.; Stanworth, R. "A Comparison of Attitudes, Opinions, and School Lunch Food Waste of 4th and 5th Grades of the Old and New School Lunch Systems", *Food & Nutrition Conference & Expo*, October 22 2013, Houston TX

**Violett, R.**; Reid, C.; **Winward, D.** "Rubber Rabbitbrush control Using a Combination of Mowing and Various Herbicide Treatments", *Western Society of Weed Science*, March 10—12 2014, Colorado Springs CO

**Violett, R.** "Creatively Implementing Experiential Learning into the General Education Curriculum", *60<sup>th</sup> Annual North America Colleges & Teachers of Agriculture Conference*, June 25—28 2014, Bozeman MT

Brown J, Clendening E, Gish S, Peterson S, Simon A, Wray M, **Clark N, Wright CB.** "Study of A1c and body fat among SUU students, staff, and faculty", *46<sup>th</sup> Annual Meeting of the Society for Nutrition Education and Behavior*, August 9—13 2013, Portland OR



## 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
  - Hurricane Care & Share
  - St. Jude's Community Dinner
- 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
  - Delta Kappa Gamma
  - 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 D. Violet

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

### Dean L. Winward

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

### Lee G. Wood

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

### Cynthia B. Wright

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





# 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
Elizabeth A. Bancroft	Assistant Professor	Zoology, Ecology	2010
Helen C. Boswell	Associate Professor	Evolutionary Biology	1999
James M. Crouch	Professional Staff	Greenhouse Specialist	1990
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
Terri J. Hildebrand	Assistant Professor	Botany	2006
Jonathan E. Karpel	Assistant Professor	Cellular/Molecular Biology	2010
Ron M. Martin	Associate Professor	Botany	1996
Laurie A. Mauger	Assistant Professor	Genetics	2011
Paul J. Pillitteri	Associate Professor	Anatomy, Physiology	2005
Paul Spruell	Associate Professor	Ecology	2007
John R. Taylor	Assistant Professor	Biology Education	2002
Mary Jo Tufte	Lecturer, Non-Tenure Track	Anatomy, Physiology	2010
Matthew S. Weeg	Assistant Professor	Neurobiology	2011

# Productivity Highlights 2013-2014

## 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; Tuft, 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

## Scholarly Publications

**Heyborne, W.H.**; Mackessy, S.P. "Identification and Characterization of a Taxon-Specific Three-Finger Toxin from the Venom of the Green Vinesnake (*Oxybelis fulgidus*; family Colubridae)", *Biochimie*, **95** (10) 2013, 1923—1932.

**Heyborne, W.H.** "A Simple and Effective Technique for Demonstrating Post-Prandial Metabolic Response of Snakes in the Classroom", *Herpetological Review*, **44** (4) 2013, 603—6045.

Polley, S.; Kuzmanov, A.; Kuang, J.; **Karpel, J.**; Lazetic, V; Karina, E; Veo, B; Fay, D. "Implicating SCF Complexes in Organogenesis in *Caenorhabditis Elegans*", *Genetics*, **196** (1) 2014, 211—223.

**Taylor, J.R.** "A Simple Inquiry-based Lab for Teaching Osmosis", *The American Biology Teacher*, **76** (4) 2014, 265—269.

## Honors, Awards and Special Recognition

### Elizabeth A. Bancroft

- 2014 SUU Outstanding Educator

### William H. Heyborne

- 2014 SUU Thunderbird Professor of the Year





## External Grants

### Jacqueline B. Grant

- *iUTAH (NSF)* Water Cycle Dynamics at the SUU Green Roof. February 2014—December 2014 (\$12,344)

### Ron M. Martin

- *Dixie National Forest (USDA)* Mobile App Field Guides. August 2013—June 2014 (\$10,000)
- *Fishlake National Forest (USDA)* Mobile App Field Guides. August 2013—June 2014 (\$10,000)
- *Bryce Canyon Natural History Association* App Server. August 2013—June 2014 (\$1000)

### Paul Spruell, et al

- *iUTAH (NSF)* Urban Transitions and Arid region Hydro-sustainability. August 2012—July 2014 (\$46,743)
- *iUTAH (NSF)* Water Chemistry and Microbial Community Composition and Diversity in Irrigation and Runoff Waters in Cedar City. (with **Fredric R. Govedich**) May 2014—June 2015 (\$22,582)

### John R. Taylor

- *CPCESU (NSF)* Bat ecology of Pipe Spring National Monument and the Kaibab Paiute Reservation. September 2010—December 2013 (\$40,000)
- *Zion-Bryce-Cedar Breaks (NPS)* Establishing Eco-Regional Baseline Bat Data. August 2012—June 2014 (\$10,000)

## Professional Memberships and Community Service

### Jacqueline A. Grant

- Member of:
  - *Society for Conservation Biology*
  - *Utah Museums Association*
- Public school outreach

### Fredric R. Govedich

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

## Memberships & Service (continued)

### William H. Heyborne

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

### Jonathan E. Karpel

- Reviewer for *panOpen*
- Volunteer for AYSO soccer

### Laurie A. Mauger

- Member of:
  - *Ecological Society of America*
  - *Evolution Society*
  - *Utah Academy of Sciences, Arts, & Letters*
  - *Wildlife Society*

### Paul Spruell

- Reviewer for *US Fish & Wildlife Service*

### John R. Taylor

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

### Mary Jo Tufte

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

### Matthew S. 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 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/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.



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

## Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Nathan A. Barker	Assistant Professor	Bioinformatics, Data Mining	2007
Michael J. 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 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 2013-14

## Scholarly Presentations at Professional Meetings

**Barker, N.; Harris, L.; Nyman, C.** "A Comparison of Student Performance: Traditional versus On-line in a Skills Based Computer Applications Course", *29<sup>th</sup> International Conference on Computers and Their Applications*, March 2014, Las Vegas NV

**Heiner, C.** "Guidelines for group work in CS1" *45<sup>th</sup> ACM SIGSE Technical Symposium*, March 2014, Atlanta GA

**Kesar, S.;** Harihara, S. K. "Social Engineering Attacks: Causes, Consequences and Mitigation Mechanisms", *ETHICOMP 2014*, June 2014, Paris France

**Kesar, S.** "Flipping the Computer Club: A Journey from STEM to STEAM Hands-on/Minds-on Activities", *ETHICOMP 2014*, June 2014, Paris France

**Tadayon, N.** "Teams using Real World Project in a Software Engineering course", *WorldComp2013*, July 2013, Las Vegas NV

**Wu, D.;** Reyhav, I. "The Role of Content and Interface Design in Mobile Tablet Training", *International Conference on Information Systems SIGHCI workshop*, December 2013, Milan Italy

Moody, G.; **Wu, D.** "Are You Annoyed? The Effects of Mobile Device User Interface and Intrusiveness of Security Notifications on User Security Perception", *International Conference on Information Systems SIGHCI workshop*, December 2013, Milan Italy

**Wu, D.;** Reyhav, I. "The Impact of Relevance, Aesthetics and Enjoyment on iPad Training", *International Conference on Information Systems SIGED meeting*, December 2013, Milan Italy

Reyhav, I.; **Wu, D.;** Ben-Eliezer, D. "A Comparison of The Role of Team Psychological Safety and Shared Task Representations in Two eLearning Systems", *International Conference on Information Systems SIGED meeting*, December 2013, Milan Italy

## Scholarly Presentations (continued)

Moody, G.; **Wu, D.** "Security, but at What Cost? An Examination of Security Notifications with a Mobile Using Platform", *50<sup>th</sup> International Conference on Human Computer Interaction*, July 2013, Las Vegas NV

**Wu, D.** "Understanding User Calendaring Behavior through a Temporal Structure Lens," *7<sup>th</sup> China Summer Workshop on Information Management*, June 2013, Tianjin, China

## Scholarly Publications

Freden, E.; **Grady, M.** "On Gelman's Subgroup Counting Theorem", *Journal of Combinatorial Mathematics and Combinatorial Computing*, **90** 2014, 1—17.

**Heiner, C.** "Mining Student Responses to Learn Answer Models: A Case Study using Data from an Introductory Programming Course", *Journal of Computing Sciences in Colleges*, **29** (2) 2013, 17--25.

Reyhav, I.; **Wu, D.** "Exploring Mobile Tablet Training for Road Safety: A Uses and Gratifications Perspective", *Computers and Education*, **71** 2014, 43—55.

Ngugi, B.; **Wu, D.;** Frank, J. "Biometric Keypad Reliability: Typing Pattern Stability and Authentication Accuracy", *Journal of Information System Security*, **8** (3) 2014 (online journal).

**Wu, D.;** Passerini, K. "Uncovering Knowledge-based Time-Management Practices: Implications for Project Management", *International Journal of Managing Projects in Business*, **6** (2) 2013, 332—348.

## Honors, Awards and Special Recognition

### Dezhi Wu

- 2014 SUU Outstanding Scholar

## 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
  - Mathematical Association of America

### Laurie Harris

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

### Cecily Heiner

- NCWIT Aspirations Award mentor
- Code Camp judge
- Sterling Scholar judge
- Member of:
  - Association for Computing Machinery
  - 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*
- NCWIT Aspirations Award program leader
- Member of:
  - Association for Computing Machinery
  - Association of Information Systems
  - Computer Science Teachers Association
  - National Center for Women and IT
  - UK Academy for Information Systems

## Memberships & Service (continued)

### Constance W. Nyman

- 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 National Honor Society
  - Intl Society for Computers and their Apps

### Robert A. Robertson

- Code Camp judge
- Member of SWATC Advisory Board

### Nasser Tadayon

- Member of:
  - Association of Computing Machinery
  - IEEE

### Dezhi Wu

- Co-chair for *AMCIS 2013* mini-track session
- Member of:
  - Association of Computing Machinery
  - Association for Information Systems
  - Project Management Institute
- Reviewer for:
  - PACIS 2014
  - Information Systems Frontiers
  - Information Management
  - International Journal of Human Computer Studies

## External Grants

### Cecily Heiner, et al

- NSF Web services in CS1 and Utah ECS Initiative (\$9000)

### Shalini Kesar, et al

- Utah Technology Intensive Concurrent Enrollment Initiative (\$4000)
- NSF Web services in CS1 and iUtah (\$5000)
- NCWIT Aspiration Award SEED grant (\$1500)

# 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 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
Boyd E. Fife	Assistant Professor	Construction Management	1993
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 2013-14

## Scholarly Presentations at Professional Meetings

**Cozzens, R.** "Bringing CAD-Based STEM Curriculum to Rural High Schools", *Solidworks World 2014*, February 2014, San Diego, CA

**Cozzens, R.** "Developing a Quality Web-Based Concurrent Engineering and Technical Design Curriculum", *Quality Matters 5<sup>th</sup> Annual National Conference*, October 2013, Nashville TN

## Documents, Books, and other Publications

**Cozzens, R.** "Module-4 Sketching & Visualization", *TICE Curriculum*, State of Utah, December 2013

**Hansen, L. S.** "Learning and Applying SolidWorks 2013-2014", *Industrial Press*, July 2013, ISBN 978-0-83113-483-9

## 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 2013—June 2014 (\$76,142)



## Professional Memberships and Community Service

**Isabella Borisova**

- Member *Utah CTE (Electronics Division President)*

**Richard K. Cozzens**

- Member *Advisory Board for Design Graphics WSU*

**Boyd E. Fife**

- Member of:
  - *Educational Advisory Board for Iron County Homebuilders Association*
  - *SWATC Advisory Board*

**David A. 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 A. Greener	Professional Staff	Computer Aided Manufacturing (CAM)	1990
Glen R. Longhurst	Associate Professor, Chair	Nuclear Engineering	2009
Thad S. Morton	Assistant Professor	Fluid Dynamics	2009
John M. Murray	Associate Professor	Mechanical Engineering, Sustainable Design	2007
Desmond N. Penny	Professor	Civil Engineering	1983

## Productivity Highlights 2013-14

### Scholarly Presentations at Professional Meetings

**Murray, J., et al** "The design and Construction of a Tiny House: Small is Beautiful", *ASEE Zone IV Conference*, April 2014, Long Beach CA

### Scholarly Publications

**Morton, T. S.** "Estimating the mean flow field in combustion chambers", *International Journal of Engine Research*, **15** 2014, 338—345.

### Professional Consulting

#### Glen Longhurst

- Pacific Northwest National Laboratory, DOE

### Professional Memberships and Community Service

#### Glen Longhurst

- Renewable Energy Fair organizer
- Member of
  - American Society for Civil Engineers
  - ASEE
  - Tech Up Southern Utah
  - Southwest Utah Renewable Energy Center Steering Committee

#### John Murray

- Member of AAAS

#### Des Penny

- Member ASEE





# Department of Mathematics

## Mission Statement

Not only does the Department of Math serve future mathematicians, scientists, business strategists and engineers, but also future teachers of mathematics as well as those pursuing studies in the arts and humanities. Except for reading, no other skill is so highly valued across the breadth of professional society as those that 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 our courses. The demand for knowledge we offer is enormous in both industry and education. In secondary schools the two greatest shortages of qualified teachers across the nation are in mathematics and technology, and jobs outlooks rate mathematics as one of the highest needs of college graduates.

## 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	Visiting Lecturer	Math Literacy	2013
James P. Brandt	Associate Professor	History of Math, Math Education	2006
Sarah M. Duffin	Associate Professor	Partial Differential Equations	2004
Eric M. Freden	Associate Professor, Interim Associate Dean	Geometric Group Theory	1997
Jian Long Han	Associate Professor	Partial Differential Equations	2005
Derek W. Hein	Associate Professor	Combinatorial Design Theory	2004
Martha Ann Larkin	Associate Professor	Math Education	1989
Andrzej M. Lenard	Visiting Lecturer	Math Literacy	2013
Jana R. Lunt	Assistant Professor	Math Education	2010
Mark H. Meilstrup	Assistant Professor	Geometric Group Theory	2011
Gretchen R. Meilstrup	Assistant Professor (on leave)	Tropical Algebra	2008
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 2013-14

## Scholarly Presentations at Professional Meetings

**Armstrong, S.** “A Stable Numerical Scheme for a System of Competing Species with Diffusion”, *MAA Intermountain Section Meeting*, March 2014, Orem UT

**Han, J** “Long-term behavior and numerical analysis of a nonlocal evolution equation with Kac potentials”, *MAA Intermountain Section Meeting*, March 2014, Orem UT

**Freden, E.** “Growth Series for Rooted Trees”, *Discrete Groups and Geometric Structures with Applications V*, June 2014, Leuven Belgium

**Larkin, M.** “Reflections of Experience”, *Utah Association of Mathematics Teacher Educators Meeting*, March 2014, Provo UT

**Schafer, E.** “Counting: As easy as 1-2-6”, *MAA Intermountain Section Meeting*, March 2014, Orem UT

**Weingartner A.** “On the maximum ratio of consecutive divisors”, *West Coast Number Theory Conference*, December 2013, Monterey CA

## Scholarly Publications

**Bahi, S** “A Time Hazard Analysis of Student Persistence: A US University Undergraduate Mathematics Major Experience”, *International Journal of Science and Mathematics Education (Springer-Verlag)*, pending printing, online version is found at <http://link.springer.com/article/10.1007/s10763-014-9538-9>

**Freden, E.;** Grady, M. “On Gelman’s Subgroup Counting Theorem”, *Journal of Combinatorial Mathematics and Combinatorial Computing*, **90** 2014, 1—17.

Adams, J.; **Freden, E.;** Mishna, M. “From Indexed Languages to Generating Functions”, *RAIRO - Theoretical Informatics and Applications*, **47** (4) 2013, 325—350.

Baker, R.; **Weingartner, A.** “Some Applications of the Double Large Sieve”, *Monatshefte für Mathematik*, **170** 2013, 261-304.

Baker, R.; **Weingartner, A.** “A Ternary Diophantine Inequality over Primes”, *Acta Arithmetica*, **162** 2014, 159-196.

## 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)



## Professional Memberships and Community Service

### James P. Brandt

- Member of *Mathematical Association of America*

### Bryan L. Bradford

- *BSA* Leader

### Sarah M. Duffin

- Board member of *Neil Simon Festival*

### Eric M. Freden

- Member of
  - *American Mathematical Society*
  - *Phi Beta Kappa National Honor Society*
  - *Parowan Shade Tree Commission*

### Derek W. Hein

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

### Martha Ann 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 R. Lunt

- Member of
  - *Mathematical Association of America*
  - *Association of Mathematics Teacher Educators*
  - *Utah Association of Mathematics Teacher Educators*

### Mark H. Meilstrup

- Member of *American Mathematical Society*

### Gretchen R. Rimmasch

- Member of *Mathematical Association of America*

### Emma L. Schafer

- 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
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
Daphne A. Solomon	Assistant Professor	Acute Care	2013
Kevin D. Tipton	Assistant Professor, Non-Tenure Track	Geriatric Nursing	2006
Janet E. Warner	Assistant Professor, Non-Tenure Track	Maternal/Newborn Nursing	2004

## Productivity Highlights 2013-14

### Scholarly Presentations at Professional Meetings

**Lister, D.J.A.;** Luther, B. "Unique Approach to New Program Development: A Care Management MS Program is Developed and Launched", *AACN 2014 Master's Education Conference*, February 2014, Scottsdale AZ

**Lister, D.J.A.** "Learning Nursing: Perspective of Practicing Nurses about Nursing School Experiences", *Drexel University Nursing Education Institute*, June 2014, Myrtle Beach, SC

**Lister, D.J.A.** "Nursing Initiatives and Issues", *Utah Organization of Nurse Leaders Annual Fall Conference*, October 2013, Thanksgiving Point 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*
- Volunteer at Valley View Medical Center
- 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*

### Alan H. Pearson

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

### Rebecca S. Rasmusson

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

## Memberships & Service (continued)

### Shelly R. Sanderson

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

### Daphne A. Solomon

- Member of:
  - *American Association of Nurse Practitioners*
  - *National League of Nursing*
  - *Utah Nurses Association*
- 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*

### Janet E. Warner

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





# 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 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
James C. Chisholm	Assistant Professor	Physics/Cosmology	2007
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
Paul R. Larson	Associate Professor	Geography	1994
C. Frederick Lohrengel II	Professor (Emeritus)	Micro-paleontology	1986
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
Radhika P. Nair	Assistant Professor	Inorganic Chemistry	2010
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
Kim H. Weaver	Associate Professor	Analytical Chemistry	2000
Nathan S. Werner	Assistant Professor	Organic Chemistry	2012

## Productivity Highlights 2013-14

### Scholarly Presentations at Professional Meetings

Davis, L.E.; **Eves, R.L.**; Pollock, G.L. "They're Just Rocks!—Overcoming the Challenges of Teaching Geology to NPS Front-line Interpreters", *Geological Society of America Section Meeting*, May 2014, Bozeman MT

**Hargrave, J.E.**; Hicks, M.K.; Scholz, C.A. "Depositional Environments of Lacustrine Carbonates of the South Basin of Lake Turkana, Kenya", *Geological Society of America Annual Meeting*; October 2013, Denver CO

Haight, G.; **Hargrave, J.E.** "A Preliminary Paleoenvironmental Analysis of a Plant Quarry in the Kaiparowits Formation of the Grand Staircase Escalante National Monument, Utah", *Geological Society of America Annual Meeting*; October 2013, Denver CO

**Larson, P.R.**; **Lohrengel, C. F.** "Potential Excess Precipitation (PEP) Value, an Additional Descriptor for Arid/Semiarid Climates", *Association of American Geographers Annual Meeting*, April 2014, Tampa FL

Chipman, J.; **MacLean, J.S.** "An Introductory Student's Perspectives on a Geology Field Trip to the Book Cliffs of Utah" *Geological Society of America Annual Meeting*; October 2013, Denver CO

Dayton, C.E.; **MacLean, J.S.** "Hydrothermal Mineralization of the Jurassic Navajo Sandstone in the Footwall of the Blue Mountain Thrust Fault, Southwestern Utah", *Geological Society of America Annual Meeting*; October 2013, Denver CO

Francisco, S.; **MacLean, J.S.**; Hofmann, M.H. "Interpreting Sedimentary Facies and Facies Associations from a 1500-ft long, Behind Outcrop Core through Upper Cretaceous Strata in SE Utah", *Geological Society of America Annual Meeting*; October 2013, Denver CO

Gardner, C.; **MacLean, J.S.** "Geologic Mapping of Fracture Density and Mineralization in the San Francisco Range, Southwestern Utah", *Geological Society of America Annual Meeting*; October 2013, Denver CO

### Scholarly Presentations (continued)

Kidman, G.; Skankey, R.; **MacLean, J.S.** "Martian plate motions in the vicinity of Valles Marineris and Tharsis Rise", *Geological Society of America Annual Meeting*; October 2013, Denver CO

**MacLean, J.S.** "Reactivation of Conjugate Faults in the Footwall of Bryce Canyon's Rubys Inn Thrust Fault", *Geological Society of America Annual Meeting*; October 2013, Denver CO

White, B.J.; **MacLean, J.S.** "What is Wilderness? Assessing the Place as Text Concept in a Partners in the Parks adventure", *National Collegiate Honors Council Conference*, November 2013, New Orleans LA

**Weaver, J.**; **Steffensen, M.B.** "Synthesis, Analysis, and Biological Activity of Novel Organoarsenic Products", *Utah Conference on Undergraduate Research*, February 2014, Provo UT

### Scholarly Publications

**Hargrave, J.E.**; Hicks, M.K.; Scholz, C.A. "Lacustrine carbonates from Lake Turkana, Kenya: A depositional model of carbonates in an extensional basin", *Journal of Sedimentary Research*, **84** 2014, 224—237.

**Larson, P.R.**; **Lohrengel, C.F.** "An Addendum to "A New Tool for Climatic Analysis using Koppen Climate Classification", *Journal of Geography*, **113** 2014, 35—38.

Madaan, N.; Kanyal, S.S.; Jensen, D.S.; Vail, M.A.; Dadson, A.E.; Engelhard, M.H.; **Samha, H.**; Linford, M.R. "Al<sub>2</sub>O<sub>3</sub> e-Beam Evaporated onto Silicon (100)/SiO<sub>2</sub>, by XPS", *Surface Science Spectra*, **20** (43) 2013 (online journal).

## Documents, Books, and other Publications

Rowley, P.D.; Biek, R.F.; Sable, E.G.; Boswell, J.T.; Vice, G.S.; Hatfield, S.C.; **Maxwell, D.J.**; Anderson, J.J. "Geologic map of the Brian Head Quadrangle, Iron County, Utah", *Utah Geological Survey*, 2014 (CDROM) ISBN 978-1-55791-881-9

**Redd, J.T.**; **Steffensen, M.B.**; Bradshaw, J.S.; Izatt, R.M. "Organic Macrocycles" in *Elsevier Reference Module in Chemistry, Molecular Sciences and Chemical Engineering*, Waltham MA, 2013, ISBN 978-0-12-409547-2

## External Grants

**David J. Maxwell**, Bridget Eastep

- CPCEU Zion and Bryce Canyon NP Archeological GIS support, 2011—2013, extended through December 2014 (\$50,704)
- Forest Service (USDA) ALP to CadNSDI GIS Conflation Project, Spring 2013—Fall 2013, extended through September 2014 (\$25,000)

**Radhika P. Nair**

- Western Alliance to Expand Student Opportunities Research Grant: Synthesis of Imines Containing Biological Molecules – Purines and Pyrimidines, Spring 2014 (\$1378)

## Professional Consulting

**David J. Maxwell**

- Beaver 30x60 Quadrangle revisions 1:100k Geology Map, Utah Geologic Survey, 2013-14 (\$5000)
- Adamsville Quadrangle revisions 1:24k Geology Map, Utah Geologic Survey, 2013-14 (\$4000)
- Soil map of Western Iron County, Terra West Consulting, 2013 (\$1500)
- GPS training for Intergovernmental Internship Cooperative NPS students, Spring 2014 (\$750)
- GIS/GPS data manipulation for Red Cliffs Reserve impacts study (pro bono)

**Mackay B. Steffensen**

- Instructor for the Rural Health Scholar professional exam preparation course, Spring 2014 (\$1000)

## Professional Memberships and Community Service

**James C. Chisholm**

- Member of American Physical Society
- Public school outreach

**Daniel J. Eves**

- Sterling Scholar Judge

**Robert L. Eves**

- Board member or Trustee of
  - Bryce Canyon Natural History Association
  - Escalante Heritage Center
  - Rocky Mountain NASA Space Grant Consortium

**Nathan A. Hanson**

- Public school outreach

**Jennifer E. Hargrave**

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

**Bruce R. Howard**

- Member of:
  - AAAS
  - American Chemical Society

**Paul R. Larson**

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

## Memberships & Service (continued)

### John S. MacLean

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

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

### Christopher F. Monson

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

### Radhika P. Nair

- Member of:
  - *American Chemical Society*
  - *Phi Beta Kappa National Honor Society*
- Reviewer for
  - *Journal of Student Research*
  - *Journal of Biotech Research*
  - *WAESO 2013-14 undergraduate projects*
- Public school outreach

### J. Ty Redd

- Member *American Chemical Society*
- Public school outreach

### Mackay B. Steffensen

- Member *American Chemical Society*
- Public school outreach

### Hussein A. Samha

- Public school outreach

### Brent A. Sorensen

- Public star parties

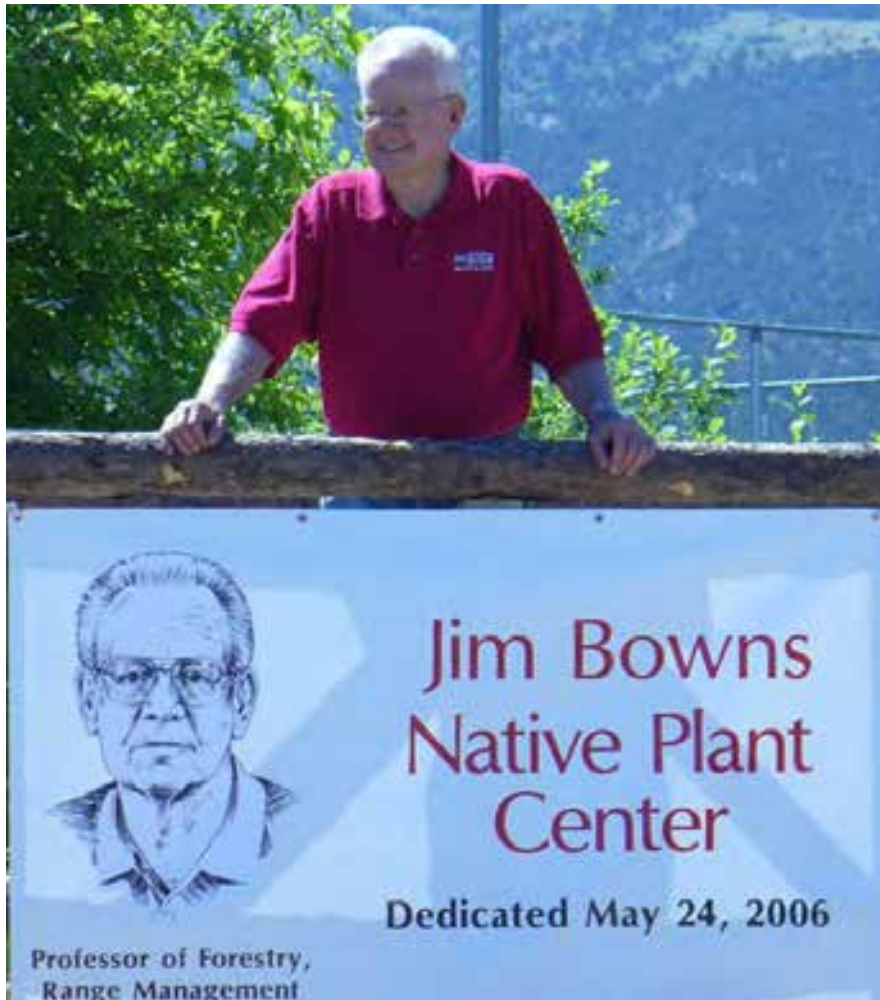
### Kim H. Weaver

- Reviewer for *Journal of Environmental Quality*
- BSA merit badge counselor

### Nathan S. Werner

- Member *American Chemical Society*





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