

2016-  
2017

Walter Maxwell Gibson  
College of Science and Engineering  
Annual Report



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# EXECUTIVE SUMMARY 2016—2017

## Summer 2017

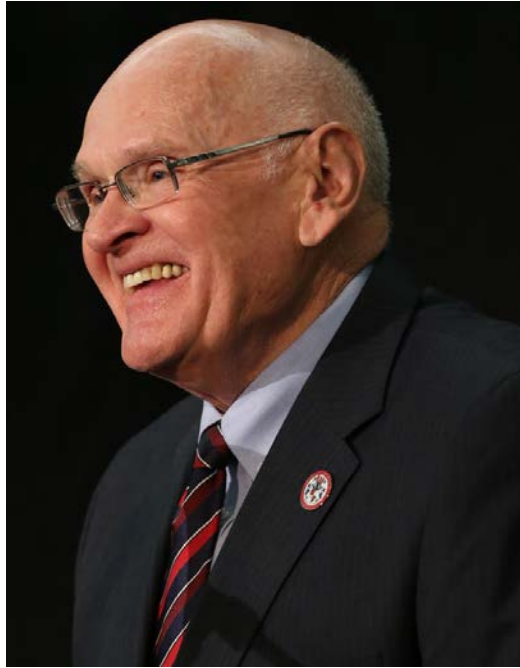
This executive summary highlights some of the accomplishments, events, and productivity which indicate the level of competence and dedication of the faculty in the Walter Maxwell Gibson College of Science and Engineering (WMG COSE)

1. Five faculty from WMG COSE received significant honors this year. Artis Grady (Associate Professor of Nutrition) received the Award of Merit 2017 from the Utah Academy of Nutrition and Dietetics. Brandon Wiggins (Assistant Professor of Physics), John MacLean (Assistant Professor of Geology), and Dezhi Wu (Associate Professor of Information Systems) obtained the SUU Outstanding Educator, SUU Distinguished Service award, and SUU Distinguished Scholar award, respectively. A 2016 Women in Tech award was bestowed upon Shalini Kesar (Associate Professor of Information Systems) by the National Center for Women & Information Technology.
2. Our healthcare professional acceptance successes were again strong this year. Data for the 2016-2017 academic year shows that 32 of the 34 WMG COSE applicants were accepted to medical school; 10 of 13 were accepted to PA school; 4 of 7 dental school applicants were successful; and 8 of 9 WMG COSE graduates who applied for pharmacy 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 first attempt pass-rate on the national standardized licensure exam (NCLEX-RN) was 49/53≈92% for this academic year which compares favorably with the national rate. The success of our students is a great tribute to the patience and determination of our nursing faculty and leadership.
4. The education partnership between SUU and SUCCESS Academy completed its 12th year of cooperation. A total of 45 students graduated with 37 of these receiving an Associate degree from SUU (30 of which were Associate of Science). SUCCESS Academy, in partnership with the Iron County School District and SUU, continues to have a lottery based on the number of applications received. This is 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/>.
5. 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 45,636 campers since 1997. This summer Professor Wittwer and her staff conducted twelve separate camp sessions and served 427 elementary students from 9 different states. Additionally, the 7<sup>th</sup> annual *Camp Extreme* engaged 42 middle school students with rock climbing, rappelling, whitewater rafting and other skills. More information is available at: <http://suu.edu/cose/center/>.

6. The College was successful in obtaining numerous grants. The largest interdisciplinary grants include:
  - WMG COSE concluded 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. Commendations are in order to Principal Investigator Jana R. Lunt and her team consisting of Bruce R. Howard, Matthew Roberts, John S. MacLean and Fredric R. Govedich.
  - The State Legislature (spearheaded by Representative Brad Last) authorized ongoing funding of \$150,000 per year to the *SUU Center for STEM Teaching and Learning* effective July 1, 2017.
  - SUU obtained a supplemental Perkins grant of \$34,000 to purchase a Yaskawa Motoman instructional robot with software and faculty training. The robot will be used for STEM outreach.
  - More external grants are listed in the department summaries of this report.
7. The *8<sup>th</sup> Annual WMG COSE Undergraduate Research Symposium* was held on November 7, 2016 in the Hunter Conference Center. The keynote speaker was Jennifer Heemstra, from the Center for Cell and Genome Science at the University of Utah. There were 38 posters and 27 oral presentations at this year's meeting. The abstracts and photos from this year's symposium are available for examination at: <http://suu.edu/cose/symposium/>.
8. WMG COSE offered numerous high school outreach events during 2016—2017, incorporating student contests, prizes, and special guests:
  - Southern region of the Utah Science Olympiad (<http://www.utahscienceolympiad.utah.edu/>)
  - Southern Utah Science and Engineering Fair (<http://suu.edu/cose/fair/>)
  - Technology Fair (<http://suu.edu/cose/techfair/>)
  - Technology, Engineering, and Computer Science Summer Camp (<http://suu.edu/cose/summercamp.html>)
  - Southern Utah Robotics Coalition (<https://sites.google.com/a/suu.edu/surc/home>)
  - Southern region of the Utah State Math Contest
9. This has been a very productive year for College faculty. For the 2016—2017 academic year, the following data were reported:
  - Refereed Scholarly Publications – 28
  - Refereed Presentations at Professional Meetings – 52
  - Books, Reports, and other Documents – 5
  - Externally Funded Grants – 16
  - Special Recognitions and Awards – 5
10. As of July 1, 2017 Jacqueline Grant, Jonathan Karpel, Jana Lunt, John MacLean, Gretchen Meilstrup, and Matthew Weeg were awarded tenure with promotion to Associate Professor. Paul Larson advanced to Full Professor. We note the retirements or resignations of three WMG COSE faculty and acknowledge their efforts on behalf of the College: Buna Sambandham, Rebecca Rasmussen and Dave Ward. Furthermore, Nica Clark completed one year of a two year leave of absence to finish a terminal degree.



## MESSAGE FROM THE DEAN



It has been another banner year for growth in the Walter Maxwell Gibson College of Science and Engineering (WMG COSE). Enrollment growth for the Institution was nearly 5% fall of 2016 (nearly 15% in the past two years), which allows more students to enjoy the WMG COSE experience, but puts a definite strain on physical and faculty resources. The central administration is very mindful of our needs and continues to provide new faculty lines (five new lines were awarded for fall, 2017) and to assist us in obtaining needed physical resources. Our progress would be significantly stymied without the support of SUU's central administration, and I express thanks on behalf of the WMG COSE.

As part of that support, a new faculty line in Engineering was awarded. This position comes at a very strategic time for SUU engineering students. Our current faculty are working very hard to increase the number of engineers we graduate, and we are very pleased with their efforts. We are also on the edge of making an announcement regarding the future of SUU engineering that will be a game changer. It would be premature to mention it now, so we look forward to doing so very soon.

Our 2+2 Construction Management (CM) agreement with Wuhan Polytechnic University (WPU), in Wuhan, China, is starting to gain some momentum. Following the economic downturn of 2008, and the retirement/resignation of our two CM faculty, our Construction Management program was placed on hiatus. At about the same time, we were approached by WPU and an agreement was forged. Chinese students complete two years of articulated coursework before coming to SUU to complete their junior and senior years in CM. Ten WPU students arrived the fall of 2016, and over 20 students are enrolled this fall. In order to make this program work, SUU faculty members must travel to China each May and offer courses that support the CM curriculum. This effort has required some additional effort from our faculty, and I express my thanks for their commitment.

As I have said so many times before, the WMG COSE quietly provides outstanding academic experiences to its students. Most of that is the result of faculty commitment and dedication. I love working with such valiant professionals.

Dean Robert L. Eves

# WALTER MAXWELL GIBSON COLLEGE OF SCIENCE AND ENGINEERING

## MISSION AND GOALS

### Mission

*The Walter Maxwell Gibson College of Science and Engineering hosts 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, Computer Science & Information Systems, Engineering and Technology, Mathematics, Nursing, and Physical Science. We operate or participate in the operation of several special learning environments that include a SUU Center for STEM Teaching and Learning, a Keck Foundation sponsored undergraduate research lab, the Ashcroft astronomical observatory, a GIS lab, a certified water lab, the Garth & Jerri Frehner Museum of Natural History, the Cedar Mountain Science Center, the Dahle Green House, 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:

- 94% acceptance to medical schools
- 57% acceptance to dental schools
- 77% acceptance to PA programs
- 89% acceptance to pharmacy 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 2016—2017, the following were reported:

- Educational Testing Service (ETS) Major Field Exams
  - Chemistry—86<sup>th</sup> percentile student average
  - Biology—54<sup>th</sup> percentile student average
  - Computer Sci—80<sup>th</sup> percentile student average
  - Math—50<sup>th</sup> percentile student average
- American Chemical Society (ACS) end-of-course exams –73<sup>rd</sup> percentile student average
- Fundamentals of Engineering exam—88<sup>th</sup> percentile student average
- Geology ACAT exam—74<sup>th</sup> percentile
- NCLEX national standardized nursing licensure exam
  - 91% pass rate for Fall 2016
  - 93% pass rate for Spring 2017

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 2016—2017

- Course syllabi were examined at the department chair level.
- Student research experiences were evaluated during local presentation of the results, including the Festival of Excellence and 8<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 2016-17

- In addition to replacing needed microscopes and other small equipment in various labs within the College, the Department of Engineering & Technology obtained a Yaskawa robot with educational software and faculty training and a new Iron Worker & Tube Bender in the machining shop.

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 2016—2017.
- 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 (and its riding arena) continues to support the SUU agriculture program.
- Cedar Mountain Science Camp served 469 students and continues to have more applicants than it can accommodate.
- The Ashcroft observatory is utilized as a teaching laboratory each semester and continues to hold community nights each Monday.
- The Water Lab continues to provide a community resource and employment and hands-on experience to SUU chemistry students.
- The Geographic Information Systems (GIS) lab is supporting coursework and completing contract work for local, state and federal agencies.
- The molecular genetics and ecology labs provide undergraduate research support

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

OBJECTIVE: foster and strengthen community and agency relationships.

ASSESSMENT: annually evaluate community and agency interaction.

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



# WALTER MAXWELL GIBSON COLLEGE OF SCIENCE AND ENGINEERING

## DEPARTMENTS AND THEIR PROGRAMS

### Department of Agriculture and Nutrition Science

#### Mission Statement

##### Agriculture Science

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

##### Human Nutrition

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

#### Programs and Degrees Offered

##### BACHELOR DEGREES

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

BS Human Nutrition/Allied Health

BS Human Nutrition/Pre-Dietetics

##### ASSOCIATE DEGREES

Agriculture: Livestock Farm Management

Agriculture: Equine Studies

##### MINORS

Agriculture

Human Nutrition

##### CERTIFICATES

Agriculture: Livestock Farm Management

#### Student Learning Outcomes

##### Agriculture Science

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

##### Human Nutrition

1. Students will demonstrate an understanding of nutrition, its language, history, findings, and applications.
2. Students will demonstrate effective and professional oral and written communication and use of current information technologies when communicating with individuals, groups, and the public.
3. Students will synthesize new knowledge from scientific literature; students will demonstrate their knowledge and understanding of the scientific method and 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 (on leave)	Human Nutrition	2011
Chad L. Gasser	Associate Professor	Animal Science	2005
Artis P. Grady	Associate Professor	Human Nutrition	1990
Andrew Heaton	Professional Staff	Agriculture/Economics	2014
Celesta Lyman	Lecturer, Non-Tenure Track	Human Nutrition	2015
Matthew C. Schmidt	Associate Professor	Human Nutrition	2001
Billie Jean Sessions	Lecturer, Non-Tenure Track	Human Nutrition	2016
Randall D. Violet	Assistant Professor	Range Science	2012
Dean L. Winward	Associate Professor	Agriculture	1990
Lee G. Wood	Associate Professor, Chair	Animal Science	2000



# Productivity Highlights 2016—2017

## Scholarly Presentations at Professional Meetings

**Grady, A.;** Gubler, R. "The scientist in the kitchen: food science for early childhood" *UACTE Annual Meeting*, 4 February 2017, Orem UT

**Grady, A.;** Gubler, R. "Start STEAM soon: plant the roots in early childhood" *Annual Early Childhood Collaboration Conference*, 10 September 2016, Cedar City, UT

Corser, G.C.; Hinton, R.D.; Nichols, N; **Schmidt, M.;** Sly, J. "Attempts at reducing an obesity stigma of a female nutritionist" *Rocky Mountain Psychological Association Annual Convention*, 7 April 2017, Salt Lake City UT

**Violett, R.** "Aspen (*Populus tremuloides*) restoration utilizing nursery-propagated seedlings" *Society for Range Management Wyoming Section Meeting*, 15 November 2016 Cody, WY

**Winward, D.L.** "Annual grass herbicide treatment" *UT/AZ Invasive Weed Update Meeting*, 12 December 2016, Hurricane UT

**Winward, D.L.** "Noxious weeds and why do we care about them?" *Dixie National Forest Summer Orientation*, 8 June 2016, Cedar City UT

## Honors, Awards and Special Recognition

**Artis P. Grady**

- *Utah Academy of Nutrition and Dietetics*, Award of Merit for 2017

## Professional Memberships and Community Service

**Chad L. Gasser**

- Editor or Reviewer for:
  - *Journal of Animal Science*
  - *Animal Reproduction Science*
  - *NACTA Journal*
- Member of:
  - *American Society of Animal Science*
  - *NACTA*
  - *SWATC/Circle 4 Farms Advisory Board*
- Judge or organizer for:
  - *FFA events*
  - *Iron County Farm Field Day*
  - *Southwest Junior Livestock Show*

**Artis P. Grady**

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

**Celesta Lyman**

- Member of:
  - *Academy of Nutrition & Dietetics*
  - *Utah Academy of Nutrition & Dietetics*
- Regional Dietitian consultant
- Public school outreach

## Professional Memberships & Community Service (continued)

### Matt Schmidt

- Regional nutrition consultant

### Billie Jean Sessions

- Member of:
  - *Academy of Nutrition & Dietetics*
  - *Utah Academy of Nutrition & Dietetics*
  - *Kappa Omicron Nu Honor Society*
- Regional Dietitian consultant

### Randall D. Violet

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

### Dean L. Winward

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

### Lee G. Wood

- Member of:
  - *American Society of Animal Science*
  - *American Quarter Horse Association*
  - *Equine Science Society*
  - *Iron County Cattlemen's Association*
  - *NAEAA*
  - *NACTA*
  - *Utah Cattlemen's Association*
- Consultant to:
  - *Rafter L Cattle Company*
  - *K. Gardner Land & Cattle Company*
  - *Grass Valley Cattle Company*





# 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
Rachel Bolus	Assistant Professor	Evolutionary Biology	2016
Helen C. Boswell	Associate Professor	Evolutionary Biology	1999
Carrie Jo Bucklin	Assistant Professor	Biology Education	2016
Roger Gold	Associate Professor	Microbiology	2016
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	Associate Professor	Zoology, Herpetology	2011
Karl Jarvis	Lecturer, Non-Tenure Track	Molecular Ecology	2016
Jonathan E. Karpel	Assistant Professor	Cellular/Molecular Biology	2010
Laurie A. Mauger	Assistant Professor	Genetics	2011
R. Matthew Ogburn	Assistant Professor	Botany	2014
Angela Patino	Staff	Greenhouse Specialist	2014
Paul J. Pillitteri	Associate Professor	Anatomy, Physiology	2005
Lindsay K. Roper	Assistant Professor	Cellular/Molecular Biology	2015
John R. Taylor	Associate Professor	Biology Education	2002
Mary Jo Tufte	Assistant Professor, Non-Tenure Track	Anatomy, Physiology	2010
Matthew S. Weeg	Assistant Professor	Neurobiology	2011
Samuel Wells	Lecturer, Non-Tenure Track	Entomology	2015

# Productivity Highlights 2016—2017

## Scholarly Presentations at Professional Meetings

**Bucklin, C.J.;** Daniel, K.L. "Changes in students phylogenetic tree-reading: a quasi-experimental design study" *National Association for Research in Science Teaching Annual Conference*, 23 April 2017, San Antonio TX

\*Hilton, P.; \*Vaughn, M.; **Boswell, H.** "Academic stress in Southern Utah University students: coping mechanisms and use of prescription medication" *Utah Conference on Undergraduate Research*, 17 February 2017, Provo UT

**Grant J.B.;** **Ogburn, R.M.** "Native plants on green roofs for water conservation, support of native pollinators, and as a seed source for community native landscaping" *Colorado Plateau Native Plants Program Annual Meeting*, 1 March 2017 Monticello UT

Burton, B.; Diekema, A.; **Grant, J.B.;** Goonan, K.; **MacLean, J.** "Semester in the Parks: fostering partnerships and outdoor learning opportunities in an immersive experience in the National Parks" *Experiential Learning Leadership Institute* 27 June 2017, Park City, UT

\*James, E.; \*Harkness, E.; **Mauger, L.A.;** **Pillitteri, P.** "The effect of acetaminophen on catalase activity in mouse liver" *Utah Academy of Sciences, Arts, & Letters Annual Conference*, 7 April 2017, Orem UT

\*Albrecht, J.M.; \*Orme, B.; **Tufte, M.J.;** **Weeg, M.S.** "The effects of *Umbellularia californica* produced terpenoids on blood vessel diameter in frogs" *National Conference on Undergraduate Research*, 27 April 2017, Memphis TN

\*Albrecht, J.M.; \*Buck, S.; **Tufte, M.J.;** **Weeg, M.S.** "The effect of eucalyptol on blood vessel diameter in frogs" *Utah Conference on Undergraduate Research*, 17 February 2017, Provo UT

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\* indicates undergraduate student

## Scholarly Articles

**Boswell, H.C.;** Seegmiller, T. Reading fiction in Biology class to enhance scientific literacy" *The American Biology Teacher* **78** (8), 644-650, DOI 10.1525/abt.2016.78.8.644

**Govedich, F.R.;** *et al* "*Helobdella blinni* sp. n. (Hirudinida, Glossiphoniidae) a new species inhabiting Montezuma Well, Arizona, USA" *Zookeys* **661**, 137-155, DOI 10.3897/zookeys.661.9728

**Heyborne, W.H.;** McMullin, K.K. "*Sceloporus uniformis* (Yellow-backed Spiny Lizard), Bifurcated Tail" in *Natural History Notes: Herpetological Review* **47** (4), 674

**Jarvis, H.K.;** *et al* "Model selection with multiple regression on distance matrices leads to incorrect inferences" *PLOS ONE* 13 April 2017, DOI 10.1371/journal.pone.0175194

**Mauger, L.A.;** *et al* "Conservation genetics of American crocodile, *Crocodylus acutus*, populations in Pacific Costa Rica" *Nature Conservation* **17** 1-17, DOI 10.3897/natureconservation.17.9714

**Weeg, M.S.;** **Grant, J.B.;** "A reliable, non-invasive technique for measuring growth in tadpoles exposed to salt" *Environmental Toxicology and Pharmacology*, **45** 2016, 95-97

## Professional Consulting

### Roger Gold

- Microbiologist for *Sharkies Pool Service* (\$100)

### Jaqualine B. Grant

- Exhibit planner: *Nat Hist Museum of Utah* (gratis)

### William H. Heyborne

- Consultant for *Fairview Museum* (gratis)

### R. Matthew Ogburn

- Botanist for *Zion Canyon Field Institute* (\$450)

### Samuel Wells

- Consultant for *Bayer CropScience* (gratis)

## External Grants

### Carrie Jo Bucklin, *et al*

- NOAA “Marine Debris Education”, August 2016—July 2017 (\$13,334 for SUU portion)
- NSF “Changing the Face of STEM in the U.S. Virgin Islands”, December 2016—November 2018 (\$19,122 for SUU portion)

### Fredric R. Govedich, *et al*

- *iUTAH (NSF)* “Water Chemistry and Microbial Community Composition and Diversity in Irrigation and Runoff Waters in Cedar City” July 2015—July 2017 (\$46,743 for SUU portion)

### Jacqueline B. Grant (PI)

- *iUTAH (NSF)* “ESPCoR Green Infrastructure for Water Quality and Pollinator Community Improvement”, January 2017—June 2017 (\$6000)

### William H. Heyborne, (PI)

- BLM “Utah reptile and amphibian inventory and monitoring”, September 2016—September 2017 (\$42,000)
- *Utah STEM Education Center* additional funding, July 2016—June 2017 (\$150,000)

### R. Matthew Ogburn and Jacqueline B. Grant

- BLM “Seed Collection, Research, Demonstration Gardens, and Outreach for Native Plants and Pollinators of the Colorado Plateau”, April 2017—March 2022 (\$67,949)

## Professional Memberships and Community Service

### Rachel Bolus

- Member of:
  - *American Ornithological Society*
  - *Animal Behavior Society*
  - *Society of Integrative & Comparative Biology*
  - *Wilson Society of Ornithology*
- Reviewer for *The Ibis*

### Carrie Jo Bucklin

- Member of *National Assoc of Biology Teachers*
- Public school outreach
- Reviewer for
  - *Water Resources Research Institute*
  - *NARST*

## Professional Memberships & Community Service (continued)

### Helen C. Boswell

- Public school outreach

### Roger Gold

- Member of *American Society for Microbiology*
- Public school outreach

### Fredric R. Govedich

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

### Jacqueline B. Grant

- Member of:
  - *NSF iUTAH External Outreach Committee*
  - *Society of Conservation Biology*
- Public school outreach

### Debra A. Hanson

- Public school outreach

### William H. Heyborne

- Member and/or reviewer for:
  - *American Malacological Society*
  - *National Association of Biology Teachers*
  - *National Science Teachers Association*
  - *Society for the Study of Amphibians & Reptiles*
  - *Southwestern Naturalist*
  - *The American Biology Teacher*
  - *Utah Science Teachers Association*
- Public school outreach

### Karl Jarvis

- Member of:
  - *Infra Eco Network Europe*
  - *International Assoc for Landscape Ecology*
  - *Society for Conservation Biology*
- Public school outreach

### Jonathan Karpel

- Public school outreach



## Professional Memberships and Community Service (continued)

### Laurie A. Mauger

- Member of:
  - *Ecological Society of America*
  - *Evolution Society*
  - *Herpetologist League*
  - *IUCN Crocodile Specialist Group*
  - *Utah Academy of Sciences, Arts, & Letters*
  - *Wildlife Society*
- Reviewer for
  - *Conservation Genetics*
  - *Journal of Animal Ecology*
  - *Journal of Heredity*
- Public school outreach

### R. Matthew Ogburn

- Member of:
  - *American Society of Plant Taxonomists*
  - *Botanical Society of America*
  - *Utah Native Plants Society*
- Public school outreach

### Lindsey K. Roper

- Public school outreach

### John R. Taylor

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

### Mary Jo Tufte

- Public school outreach

### Samuel Wells

- Associate or member of:
  - *Los Angeles County Museum*
  - *California State Collection of Arthropods*
  - *Coleopterists Society*
  - *Zootaxa*



# 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 Walter Maxwell Gibson College of Science and Engineering by providing a high quality graduate and undergraduate education to students through certificate, associate, baccalaureate, and master degree programs.

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

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

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

## Programs and Degrees Offered

### BACHELOR DEGREES:

BS Computer Science  
BS Information Systems

### ASSOCIATE of APPLIED SCIENCE

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)

### MASTERS PROGRAM

Cyber Security & Information Assurance

## 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.

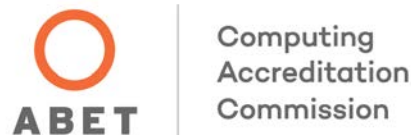
### Computer Science Program Criteria

- 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

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

## Special Accreditation



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



## Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Timothy Ball	Assistant Professor	Cybersecurity	2016
Nathan A. Barker	Associate Professor	Bioinformatics, Data Mining	2007
Michael J. Grady	Associate Professor	Algorithms, Computational Mathematics	2001
Laurie L. Harris	Assistant Professor, Non-Tenure Track	Computer Literacy	2010
Cecily Heiner	Assistant Professor	AI, Machine Learning	2011
Shalini Kesar	Associate Professor	E-commerce, Information Security	2007
Robert A. Robertson	Associate Professor, Chair	Network and Cyber-Security	2001
Nasser Tadayon	Associate Professor	Data Mining, Neural Networks	2005
Dezhi Wu	Associate Professor	Human-Computer Interface	2005



# Productivity Highlights 2016—2017

## Scholarly Presentations at Professional Meetings

**Ball, T.** "The forensics of plagiarism: a case study in cheating" *SANS Digital Forensics Summit & Training*, 22 June 2017, Austin TX

**Barker, N.;** \*Walkup, C. "Research of Apple app development using the Swift programming language and Xcode" *Utah Conference on Undergraduate Research*, 17 February 2017, Provo UT

**Barker, N.;** **Harris, L.** "Adding computer application curriculum into a fully integrated General Education experience" *25<sup>th</sup> Annual Rocky Mountain Conference of the Consortium for Computing Sciences in Colleges*, 14 October 2016, Denver CO

**Heiner, C.** "A brief introduction to educational data mining" *Educational Data Hackathon at the Holodeck*, 1 October 2016, Salt Lake City UT

**Kesar, S.** "Exploring the implications of new emerging technologies: case study in USA and India" *Ethicomp 2017*, 5 June 2017, Turin Italy

**Kesar, S.;** Pollard, J. "Designing and teaching computing capstone class: a case study involving forest service project" *Ethicomp 2017*, 6 June 2017, Turin Italy

**Kesar, S.;** Pollard, J. "Research grants and agreements: how to get them and keep them" *Experiential Learning Leadership Institute* 27 June 2017, Park City, UT

Reychav, I.; **Wu, D.** "The impact of cognitive complexity on mobile collaborative training" *2016 International Conference of Information Systems*, 10 December 2016, Dublin Ireland

\*Jeppson, M.; **Wu, D.**, "Designing and examining augmented virtuality in network monitoring systems" *Utah Conference on Undergraduate Research*, 17 February 2017, Provo UT

## Scholarly Articles

**Barker, N.;** **Harris, L.** "Adding computer application curriculum into a fully integrated General Education experience" *Journal of Computing Sciences in Colleges*, 32 (2), 77-82

Hu, H.; **Heiner, C.;** Gagne, T.; Lyman, C. "Building a statewide Computer Science teacher pipeline" *Proceedings of the 2017 ACM SIGCSE Technical Symposium on Computer Science Education* [doi.org/ 10.1145/3017680.3017788](https://doi.org/10.1145/3017680.3017788)

**Wu, D.;** Ngugi, B.; Moody, G.; "Identifying new temporal structure requirements for calendar systems through a temporal structure lens" *Computers in Human Behavior* 64 728-738

Reychav, I.; **Wu, D.;** "The interplay between cognitive task complexity and user interaction in mobile collaborative training" *Computers in Human Behavior* 62 333-345

## External Grants

**Cecily Heiner, et al**

- NSF Utah ECS Initiative (\$3000)

**Shalini Kesar, et al**

- NCWIT Aspiration Award SEED grant (\$3000)

## Honors, Awards and Special Recognition

**Shalini Kesar**

- 2016 Women in Tech Award

**Dezhi Wu**

- 2017 SUU Distinguished Scholarly/Creative Activity

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\* indicates undergraduate student

## 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*
  - *St. George Code Camp Committee*

### Michael J. Grady

- Member of:
  - *Association for Computing Machinery*

### Laurie Harris

- Member of:
  - *ACTE*
  - *UACTE*
  - *National Business Education Association*

### Cecily Heiner

- Grant reviewer for *Komen Foundation, Utah Affiliate*
- Public school outreach
- Member of:
  - *National Center for Women and IT*
  - *NSF Review Panel*
  - *AP Reader*
  - *Rocky Mountain CCSC*

### Shalini Kesar

- Editor/reviewer for:
  - *Ethicomp 2017*
  - *Journal of Information, Communication and Ethics in Society*
  - *Journal for Information Science & Technology*
  - *Journal of Research on Women and Gender*
- *NCWIT Aspirations Award* program leader
- Public school outreach
- Member of:
  - *Association for Computing Machinery*
  - *Association of Information Systems*
  - *London School of Economics Alumni Assoc*
  - *National Center for Women and IT*
  - *SheTech Board*
  - *UACTE*
  - *UK Academy for Information Systems*

### Robert A. Robertson

- Member of *SWATC Advisory Board*

### Nasser Tadayon

- *Code Camp* judge
- Member of:
  - *IEEE*
  - *Utah State Computer Proficiency Task Force*

### Dezhi Wu

- Member of:
  - *Association for Computing Machinery*
  - *Association of Information Systems*
- Public school outreach
- Reviewer for:
  - *AMCIS 2017* conference
  - *HCI 2017* conference
  - *European Journal of Information Systems*
  - *Information & Management*
  - *International Journal of Electronic Commerce*
  - *International Journal of Human-Computer Studies*



# Department of Engineering & Technology

## Mission Statement

The Department of Engineering and Technology provides students with academic instruction and skill development, by 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 is also 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. Engineering and Technology faculty are committed to providing high-quality education, individual guidance and assistance to students, helping them to develop the attributes of critical thinking, effective communication, lifelong learning, and individual integrity while pursuing their academic goals to assist in the economic development of the region through partnerships with industry.

## Programs and Degrees Offered

### BACHELOR DEGREES

BA/BS in:

Construction Management

Engineering

Engineering Technology

- Arch/Civil Design Emphasis
- CAD/CAM Emphasis
- CAD/GIS Emphasis
- EET Emphasis



Engineering  
Accreditation  
Commission

The Engineering Bachelor Degree is ABET accredited.

### MINORS

CAD/CAM Technology

Construction Technology

Electronics Technology

### ASSOCIATE OF APPLIED SCIENCE

CAD/CAM Technology

Construction Technology

Electronics Technology

Pre-Engineering

### CERTIFICATES

Civil Design/CAD

Construction Technology

## Engineering Student Learning Outcomes

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



Engineering  
Technology  
Accreditation  
Commission

The Engineering Technology Bachelor Degree with CAD/CAM or EET Emphasis is ABET accredited.

## Engineering 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
Jared Baker	Professional in Residence, Non-Tenure Track	Project Management	2016
Sangho Bok	Visiting Assistant Professor	Electrical Engineering	2016
Isabella M. Borisova	Assistant Professor, Non-Tenure Track	Electronics and Computer Technology	2011
Richard K. Cozzens	Professional in Residence, Non-Tenure Track	2D and 3D Design	2001
Roger A. Greener	Professional Staff	Computer Aided Manufacturing (CAM)	1990
L. Scott Hansen	Associate Professor, Chair	Technology Education	2007
Scott Munro	Associate Professor	Aerospace Engineering, Acoustics	2015
Matthew Roberts	Professor, Associate Chair	Civil Engineering	2014
Ali S. Siahpush	Associate Professor	Mechanical Engineering, Thermodynamics	2015
David A. Ward	Associate Professor	Electronics Technology	1985



# Productivity Highlights 2016—2017

## Scholarly Presentations at Professional Meetings

**Bok, S.;** *et al* "Fluorescence Based Temperature Sensor for In-Situ Sub-Micron Heat Detection on D/H-Loaded Palladium Electrode Surfaces" *20<sup>th</sup> International Conference on Condensed Matter Nuclear Science*, 3 October 2016, Sendai Japan

**Bok, S.;** *et al* "Flourescence-based temperature sensor for in-situ imaging local temperature of aluminum nanoparticles on plasmonic gratings" *IEEE Sensors 2016*, Orlando FL

**Munro, S.E** "Teaching an introductory Engineering course that also satisfies a Humanities General Education requirement," *8<sup>th</sup> Annual First Year Engineering Experience Conference*, 2 August 2016, Columbus OH

**Munro, S.E** "Assessment and lessons learned from partially flipping a statics course" *2016 ASEE Rocky Mountain Section Conference*, 1 October 2016, Cedar City UT

Farnsworth, C.B.; Ziegenfuss, D.H.; **Roberts, M.W.** "A model workshop for helping new faculty engage students in the STEM classroom" *124<sup>th</sup> Annual ASEE Conference & Expo*, 25 June 2017, Columbus, OH

Carter, J.; **Siahpush A.S.** "Simple strength of material experiment to evaluate the deflection of a beam" *Utah Academy of Sciences, Arts & Letters Annual Conference*, 7 April 2017, Provo UT

Cooper, C.; **Siahpush A.S.** "Fundamental look at the properties of copper" *Utah Academy of Sciences, Arts & Letters Annual Conference*, 7 April 2017, Provo UT

## Scholarly Articles

**Bok, S.;** *et al* "Super-resolution light microscopy using plasmonic gratings" *Microscopy Today* 25 (1), 42—47

**Bok, S.;** *et al* "Plasmonic nano-protrusions: hierarchical nanostructures for single-molecule Raman spectroscopy" *Nanotechnology* 28 (2), 025302

## Documents, Books, and other Publications

**Hansen, L.S.** "Autodesk Inventor 2018—A Tutorial Introduction", *SDC Publications* 2017. ISBN 978-1-63057-090-3

## External Grants

**Richard Cozzens (PI)**

- *Utah Cluster Acceleration Partnership* STEM Career Paths to Success, July 2016—June 2017 (\$99,136)

**Matthew Roberts (co-PI), et al**

- *NSF Division of Undergraduate Education* Training Next Generation Faculty, September 2013—August 2017 (\$359,198)

**Scott Munro, Ali S. Siahpush**

- *Utah Space Consortium* July 2016—June 2017 (\$2000)

## Professional Consulting

**Scott Munro**

- Consultant for *Neany Inc.* and *Naval Air Warfare Center Weapons Division* (\$1200)



## Professional Memberships and Community Service

### Sangho Bok

- Member of:
  - ASEE
  - *Sigma Xi Society*
- Reviewer for:
  - *Journal of Electrochemical Society*
  - *National Science Foundation*
  - *Surface and Coatings Technology*

### Isabella Borisova

- Member of:
  - ASEE
  - *Utah Women in Higher Education Network*
- Volunteer for *Utah SkillsUSA*
- Public school outreach

### Richard K. Cozzens

- Member of:
  - ASEE
  - *WSU DT Advisory Board*
  - *Utah Manufactures Association*
  - *USOE E&T Advisory Board*
- Public school outreach
- Fellow for *LMU Leeds Sustainability Institute*
- Volunteer for *Utah SkillsUSA*

### Scott Hansen

- Public school outreach

### Matthew Roberts

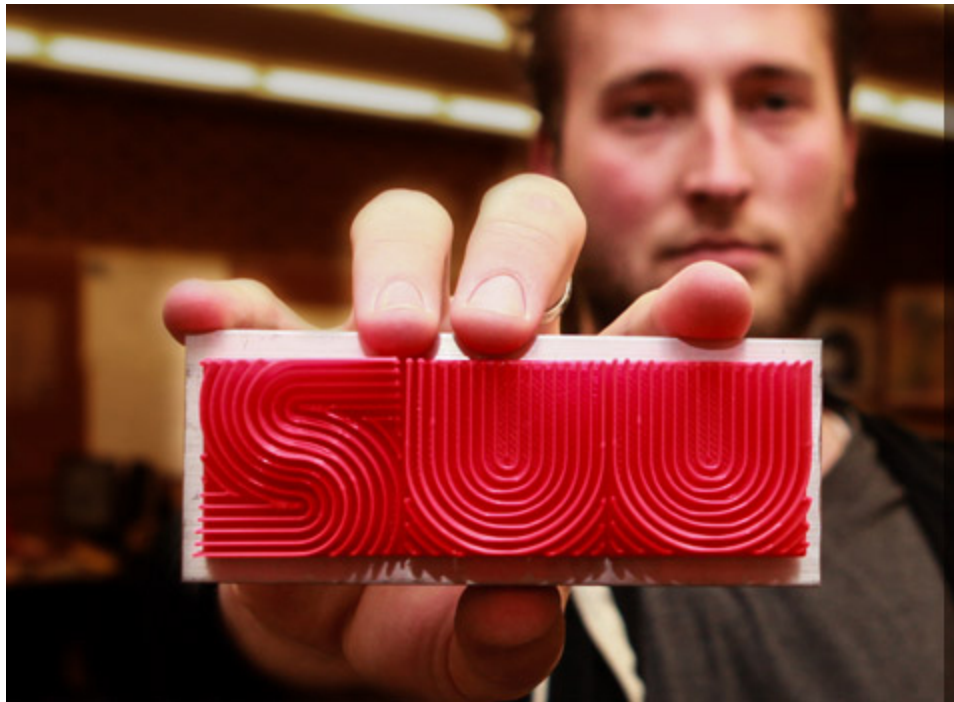
- Member/reviewer for:
  - ASEE
  - NCEES
- Chief Editor for *Journal of Professional Issues in Engineering Education and Practice*

### Ali S. Siahpush

- Editor/reviewer for:
  - *ASME Heat Transfer*
  - *ASME Thermal Engineering*
  - *Experimental Thermal & Fluid Science*
  - *Journal of Energy Storage*
  - *Progress in Nuclear Energy*
  - *Solar Energy*
  - SPA
- Board member of
  - *Utah NASA Space Grant Consortia*
  - *Idaho NASA Space Grant Consortia*

### David A. Ward

- Volunteer for *Utah SkillsUSA*
- Public school outreach



# Department of Mathematics

## Mission Statement

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

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

## Programs and Degrees Offered

### BACHELOR DEGREES

BS Mathematics:

Actuarial Science Emphasis

Pure Math Emphasis

BS Mathematics Education

### MINORS

Mathematics:

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	Professor	Partial Differential Equations	2001
Said Bahi	Professor	Operations Research	2001
Bryan L. Bradford	Lecturer, Non-Tenure Track	Math Literacy	2013
James P. Brandt	Associate Professor, Chair	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
Jianlong Han	Associate Professor (on Sabbatical)	Partial Differential Equations	2005
Derek W. Hein	Associate Professor	Combinatorial Design Theory	2004
Dongyang Kuang	Visiting Assistant Professor	Mathematical Modeling	2016
Jana R. Lunt	Assistant Professor	Math Education	2010
Gretchen R. Meilstrup	Assistant Professor	Algebraic Geometry	2008
Mark H. Meilstrup	Assistant Professor	Geometric Group Theory	2011
Andrew F. Misseldine	Lecturer, Non-Tenure Track	Representation Theory	2014
Buna Sambandham	Lecturer, Non-Tenure Track	Fractional Calculus	2016
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 2016—2017

## Scholarly Presentations at Professional Meetings

**Bahi, S.** "On the variance ratio test and its implications" *MAA Intermountain Section Meeting*, 7 April 2017, Ogden UT

**Duffin, S.M.** "Incorporating current events and real-life applications into introductory statistics classes" *MAA Intermountain Section Meeting*, 7 April 2017, Ogden UT

**Freden, E.** "Growth in groups" *Joint Mathematics Meetings*, 4 January 17, Atlanta GA

**Hein, D.** "Decompositions of  $\lambda K_n$  into LOW and OLW Graphs" *MAA Intermountain Section Meeting*, 7 April 2017, Ogden UT

**Hein, D.** "Decompositions of  $\lambda K_n$  into LOW and OLW Graphs" *26<sup>th</sup> Coast Combinatorics Conference*, 14 February 2017, Kona HI

**Weingartner, A.** "When shifted primes are practical" *West Coast Number Theory Conference*, 17 December 2016, Pacific Grove, CA

## Documents, Books, and other Publications

**Freden, E.M.** "Growth in Groups", Chapter 12 in *Office Hours with a Geometric Group Theorist*, Clay & Margalit, editors. Princeton University Press, June 2017. ISBN 978-0-691-15866-2

## Professional Consulting

**Eric Freden**

- Math consulting for *Casino Game Maker* (\$405)

**Jana Lunt**

- Teacher development at *Iron Springs Elementary School* (\$300)

**Andrew Misseldine**

- Software consultant for *Macmillan Learning* (\$50)

## Scholarly Articles

**Brandt, J.P.; Lunt, J.R.; Rimmasch, G.R.** "Mathematicians' and math educators' views on 'doing mathematics'" *PRIMUS* **26**, 753-769.

**Hein, D.** "A new construction for decompositions of  $\lambda K_n$  into LE graphs" *Journal of Combinatorial Mathematics and Combinatorial Computing* **100**, 37—43

**Hein, D.** "Generalized Stanton-type graphs" *Journal of Combinatorial Mathematics and Combinatorial Computing* **101**, 59—71

**Camassa, R.; Kuang, D.; Lee, L.** "A geodesic landmark shooting algorithm for template matching and its applications" *SIAM Journal on Imaging Sciences* **10** (1), 303-334

**Sambandham, B.** "Generalized monotone method for sequential Caputo fractional boundary value problems" *Journal of Advances in Applied Mathematics* **1** (4) DOI 10.22606/jaam.2016.14005

**Weingartner, A.** "On the degrees of polynomial divisors over finite fields" *Mathematical Proceedings of the Cambridge Philosophical Society* **161** (3), 469—487

**Pomerance, C.; Thompson, L.; Weingartner, A.** "On integers  $n$  for which  $X^n - 1$  has a divisor of every degree" *Acta Arithmetica* **175** (3), 225—243

## External Grants

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

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

**Eric Freden (PI)**

- *Carl D. Perkins Career and Technical Education* July 2016—June 2017 (\$115,988)
- *Supplemental Perkins Robotics Award* December 2016—June 2017 (\$34,000)



## Professional Memberships and Community Service

### James P. Brandt

- Member of
  - *Mathematical Association of America*
  - *UAMTE*

### Eric M. Freden

- Member of
  - *American Mathematical Society*
  - *Phi Beta Kappa*
- Reviewer for *MathSciNet*

### Jianlong Han

- Reviewer for
  - *Journal of Discrete & Cont Dyn Systems*
  - *Journal of Differential Equations*

### Derek W. Hein

- Fellow of *The Institute of Combinatorics and its Applications*
- Member of *Mathematical Association of America*
- Reviewer for:
  - *International Workshop on Graph Labelings*
  - *JCMCC*

### Jana R. Lunt

- Public school outreach

### Mark H. Meilstrup

- Member of *American Mathematical Society*

### Gretchen R. Meilstrup

- Member of *Mathematical Association of America*

### Andrew F. Misseldine

- Public school outreach

### Buna Sambandham

- Public school outreach

### Emma L. Schafer

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

### Andreas J. Weingartner

- Member of *American Mathematical Society*
- Reviewer for *MathSciNet*

### Cecilia L. Weingartner

- Public school outreach



# 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. 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. Use evidence as the basis for clinically competent contemporary nursing care.
- C. Communicate effectively using various means in a variety of roles and settings.
- D. Optimize health care to diverse individuals, families, groups and communities through collaboration with interdisciplinary health care teams.
- E. Demonstrate intellectual curiosity, critical thinking, and motivation toward life-long learning.
- F. Influence the quality of nursing and health care using leadership skills, management concepts, and a knowledge of the political system.
- G. Be legally and ethically accountable for clinical nursing practice.
- H. 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
Donna De Silva	Assistant Professor, Non-Tenure Track	Pediatric Care	2015
Elizabeth A. Hatfield	Professional Staff	Nursing Lab Specialist	2002
Selwyn Layton	Assistant Professor	Nursing Education	2009
Donna J. A. Lister	Associate Professor, Chair	Clinical Nursing	2005
SheriDawn Neilson	Assistant Professor, Non-Tenure Track	Critical/Trauma Care	2015
Rebecca S. Rasmusson	Assistant Professor, Non-Tenure Track	Family Nursing	2006
Bree Rayburn	Assistant Professor, Non-Tenure Track	Maternal & Newborn Nursing	2016
Kevin D. Tipton	Assistant Professor	Geriatric Nursing	2006



# Productivity Highlights 2016—2017

## Scholarly Presentations at Professional Meetings

Lister, D.J.A. "Modern advocacy: nurses advocacy in Utah's political climate" *Utah Nurses Association Annual Advocacy Preparation Conference, 27*  
October 2016, Salt Lake City UT

## Professional Memberships and Community Service

### Donna De Silva

- Member of:
  - American Association of Critical Care Nursing
  - American Association of Nurse Practitioners
  - Girl Friend Factor
  - Hospice and Palliative Nursing Association
  - International Association of Forensic Nurses
  - National League of Nursing
  - SWATC Occupational Advisory Committee
  - Utah Nurse Practitioners Association
- Public school outreach
- Volunteer for *Canyon Creek Women's Crisis Center*

### Selwyn Layton

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

### Donna J. A. Lister

- Member of:
  - Academic Leadership Committee
  - American Association of Nurse Practitioners
  - Cedar City Hospital Board
  - National League of Nursing
  - SW Region Clinical Coordination Council
  - Utah Division of Professional Licensing
  - Utah Nurses Association
  - Utah Nursing Consortium
  - Utah Nurse Practitioners Association

## Professional Memberships and Community Service (cont.)

### SheriDawn Neilson

- Member of:
  - Air & Surface Transport Nurses' Association
  - Emergency Nurses Association
  - National League of Nursing
- Public school outreach

### Rebecca S. Rasmusson

- Member of:
  - American Association of Nurse Practitioners
  - Association of Utah Nurse Practitioners
  - Beaver Valley Hospital Medical Staff Association
  - Camp Kesem Advisory Board
  - National League of Nursing
  - Utah Nurses Association
- Public school outreach

### Bree Rayburn

- Member of:
  - American Nurses Association
  - National League of Nursing
- Medical volunteer for *Camp Kesem 5K Fun Run*

### Kevin D. Tipton

- Member of:
  - American Nurses Association
  - Emergency Nurses Association
  - Future of Nursing Campaigning for Action
  - Mothers Against Drunk Driving
  - National League of Nursing
  - National League of Nursing
  - Utah Organization for Nurse Leaders
  - Cedar City Hospital ER Council

# Department of Physical Science

## Mission Statement

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

## Programs and Degrees Offered

### BACHELOR DEGREES

BA/BS Physical Science Composite:  
Teacher Education Emphasis

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

BS Geology:  
Professional Emphasis

### MINORS

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

### CERTIFICATES

Geographic Information System

## Student Learning Outcomes

### Chemistry

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

### Geology

Students will demonstrate mastery of the following outcomes:

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

## Special Accreditation



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

## Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Kristina B. Bronsema	Professional Staff	Lab Specialist	1997
Daniel J. Eves	Associate Professor	Bio-analytical Chemistry	2009
Robert L. Eves	Professor, Dean	Geochemistry	1988
Bruce R. Howard	Professor	Biochemistry	2002
Jason F. Kaiser	Assistant Professor	Mineralogy	2014
Paul R. Larson	Associate Professor	Geography	1994
John S. MacLean	Assistant Professor	Structural Geology	2010
David J. Maxwell	Lecturer, Non-Tenure Track	GIS	1997
Christopher F. Monson	Assistant Professor	Analytical Chemistry	2011
Cameron Pace	Assistant Professor	Physics/Astronomy	2015
Elizabeth Pierce	Assistant Professor	Biochemistry	2015
J. Ty Redd	Professor, Chair	Organic Chemistry	1990
Guizella Rocabado	Assistant Professor	Medicinal Chemistry	2015
Matthew Rowley	Assistant Professor	Organic Chemistry	2016
Hussein A. Samha	Professor	Inorganic Chemistry	2001
Grant Shimer	Assistant Professor	Sedimentology	2016
Mackay B. Steffensen	Associate Professor	Organic Chemistry	2006
Elaine Vickers	Lecturer, Non-Tenure Track	Inorganic Chemistry	2014
Kim H. Weaver	Professor	Analytical Chemistry	2000
Nathan S. Werner	Assistant Professor	Organic Chemistry	2012
Brandon K. Wiggins	Assistant Professor	Computational Astrophysics	2016
Rhett R. Zollinger	Assistant Professor	Physics/Astronomy	2015

# Productivity Highlights 2016—2017

## Scholarly Presentations at Professional Meetings

Bash, J.L.; **MacLean, J.S.** "SUU's Care and Support Team: building a community of support for students in emotional distress" *Utah Campus Compact Engaged Faculty Retreat*, 10 February 2017, Moab UT

**MacLean, J.S.**; Corser, G. "Bryce Connections: a two week learning opportunity for incoming honors freshmen" *51<sup>st</sup> Annual Meeting of the National Collegiate Honors Society*, 15 October 2016, Seattle WA

**MacLean, J.S.**; Sears, J.W. "Grenville foreland basin links Siberia-west Laurentia paleocontinental connection" *Geological Society of America Annual Meeting*, 26 September 2016, Denver CO

Sears, J.W.; **MacLean, J.S.** "Siberia-west Laurentia paleocontinental connection: constraints from Mesoproterozoic cratonic basins" *Geological Society of America Annual Meeting*, 26 September 2016, Denver CO

\*Barney, J.L.; **Monson, C.F.** "Diffusion-limited titration using microfluidics" *Utah Conference on Undergraduate Research*, 17 February 2017, Provo UT

\*Harkness, E.; **Monson, C.F.** "A microfluidic device for oxygen quantitation in anoxic environments" *American Water Resources Association, Utah Chapter Meeting*, 29 March 2017, Logan UT

\*Hutchinson, D.; **Monson, C.F.** "Migration of lipids in a supported lipid bilayer" *Utah Academy of Sciences, Arts, & Letters Annual Conference*, 7 April 2017, Orem UT

\*Pender, A.; **Monson, C.F.** "Unexpected copper nanoparticle synthesis from bulk copper metal," *Utah Conference on Undergraduate Research*, 17 February 2017, Provo UT

**Monson, C.F.**; \*Reynolds C. "Phosphatidylserine-containing supported lipid bilayers as copper-binding protein filters" *FACSS SciX 2016*, 12 October 2016, Minneapolis MN

**Pace, C.**; *et al* "Active galaxy feedback on neighboring galaxies: a pilot study" *Utah Conference on Undergraduate Research*, 17 February 2017, Provo UT

**Vickers, E.B.** "Fiction (and nonfiction) in the chemistry classroom: increasing students' engagement and higher-level literacy through a self-selected reading challenge" *Biennial Conference on Chemical Education*, 2 August 2016, Greeley CO

\*Pereira, M.R.; \*Maedgen, R.L.; **Werner, N.S.** "Evaluation of the stereochemical selectivity of the nucleophilic addition reaction of the menthylmagnesium chloride Grignard reagent with phenyl isocyanate" *Utah Academy of Sciences, Arts, & Letters Annual Conference*, 7 April 2017, Orem UT

**Wiggins, B.K.** "Neutron star mergers in the evolving universe" *8<sup>th</sup> Huntsville Gamma-Ray Burst Symposium*, 28 October 2016, Huntsville AL

**Wiggins, B.K.** "Smoothed particle hydrodynamics simulations of double white dwarf mergers" *Utah Academy of Sciences, Arts, & Letters Annual Conference*, 7 April 2017, Orem UT

Winn, S.; **Monson, C.F.** "Development of a low-cost PDMS modular microfluidic device for STR analysis of genomic DNA" *Utah Academy of Sciences, Arts, & Letters Annual Conference*, 7 April 2017, Orem UT

**Zollinger, R.** "Science education & outreach with portable planetariums & IR cameras" *American Association of Physics Teachers, Utah-Idaho Section Meeting*, 15 April 2017, Salt Lake City UT

## Honors, Awards and Special Recognition

**John S. MacLean**

- SUU 2016-2017 Distinguished Service

**Brandon K. Wiggins**

- SUU 2016-2017 Outstanding Educator

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\*indicates undergraduate student

## Scholarly Publications

Adams, M.J.; Howard, B.R. "X-ray analysis of lead(II) binding to Haloferax volcanii malate Synthase" *Journal of the Utah Academy* **93**, 77-96

\*Standler, C.; \*Overson, G.B.; \*Black, C.A.; Rocabado, G.A.; Howard, B.R. "Use of the Bruker AXS SMART BREEZE™ system for macromolecular X-ray data collection" *American Journal of Undergraduate Research* **13** (4), 11-20

Lohrengel, C.F.; Larson, P.R. "Collecting data to construct an isoline map" *The Geography Teacher* **14** (1), 25-35

\*Bulloch, T.M.; \*Argyle, T.C.; \*Parson, M.G.; Monson, C.F. "Patterning supported lipid bilayers using magnetic tweezers" *Journal of the Utah Academy* **93**, 269-281

Pierce, E.; *et al* "Molecular basis for the broad selectivity of a peptide prenyltransferase" *Proceedings of the National Academy of Sciences* **113** (49), 14037-14042

Rowley, M.; *et al* "Global analysis of Perovskite photophysics reveals importance of geminate pathways" *Journal of Physical Chemistry C* **121** (2), 1062–1071 DOI: 10.1021/acs.jpcc.6b11547

Smidt, J.; Wiggins, B.K.; Johnson, J.L. "Ab initio cosmological simulations of CR7 as an active black hole" *Astrophysical Journal Letters* **829** L6

Wiggins, B.K.; Smidt, J.; Johnson, J.L. "Lyman-alpha emission from infant black holes in the early universe" *Journal of the Utah Academy* **93**, 307-326

Wiggins, B.K.; *et al* "Extreme supernova models for the super-luminous transient ASASSN-15lh" *Astrophysical Journal* **828** (2) 94

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\* indicates undergraduate student

## Documents, Books, and other Publications

MacLean, J.S.; Sears, J.W. editors *Belt Basin: Window to Mesoproterozoic Earth* Geological Society of America Special Publication **522**, 2016. DOI 10.1130/SPE522

Sears, J.W.; MacLean, J.S.; Parker, S.D. "Transect across the northeastern margin of the Mesoproterozoic Belt Basin and Lewis thrust, Glacier National Park, Montana" in *Unfolding the Geology of the West* Keller & Morgan, editors. Geological Society of America Field Guide **44**, 2016. 231-245 DOI 10.1130/9780813700441

MacLean, J.S.; White, B.J.; Schmidt, A. "The Unexpected Wilderness of Sequoia National Park" in *Partners in the Parks: Field Guide to an Experiential Program in the National Parks* (2<sup>nd</sup> edition) Thiessen-Reilly & Digby, editors. National Collegiate Honors Council Monograph Series, 147-158 ISBN 978-0-9911351-2-7

## External Grants

David J. Maxwell

- *Natel Energy Inc* Renewable Energy GIS, May 2017 (\$30,000)

Christopher F. Monson, Kim H. Weaver, *et al*

- *iUTAH (NSF)* "Oxygen quantitation in anoxic waters and correlation to microbial life", 2016-2017 (\$19,920)

Brandon K. Wiggins, Joseph Smidt

*Los Alamos National Laboratory* "Massive Black Hole Formation", Summer 2017 (\$33,302 SUU portion)

## Professional Consulting

Christopher F. Monson

- Advisor for *Pearson Publishing* (\$75)
- Reviewer for *Sapling Learning* (\$150)

Brandon K. Wiggins

- Consulting scientist for *Los Alamos National Laboratory* (\$1500)

## Professional Memberships and Community Service

### Daniel J. Eves

- Member of *National Science Teachers Association*
- Public school outreach

### Bruce R. Howard

- Member of AAAS
- Public school outreach

### Jason Kaiser

- Member of:
  - *American Association of Petroleum Geologists*
  - *American Geophysical Union*
  - *Association for Women Geoscientists*
  - *Geological Society of America*
  - *National Association of Geoscience Teachers*
  - *National Collegiate Honors Council*
  - *Utah Geological Association*

### Paul R. Larson

- Member of:
  - *Association of American Geographers*
  - *Iron County Historical Society*
  - *National Council for Geographic Education*
  - *National Geographic Society*
  - *Phi Kappa Phi*

### John S. MacLean

- Member of:
  - *American Association of Petroleum Geologists*
  - *Association of Women Geoscientists*
  - *Geological Society of America*
  - *Utah Geological Association*
  - *National Collegiate Honors CouPublic school outreach*

### David J. Maxwell

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

### Christopher F. Monson

- Member of:
  - *American Chemical Society*
  - *Utah Academy of Sciences, Arts & Letters*
- Public school outreach

### Cameron Pace

- Member of *Great Basin Observatory Consortium*
- Public school outreach

### J. Ty Redd

- Member of *American Chemical Society*

### Hussein A. Samha

- Public school outreach

### Grant Shimer

- Member of:
  - *American Association of Petroleum Geologists*
  - *Geological Society of America*
  - *Sigma Gamma Epsilon*
  - *Society for Sedimentary Geology*

### Mackay B. Steffensen

- Member of:
  - *American Chemical Society*
  - *UCUR Steering Committee*
- Reviewer for:
  - *Tetrahedron Letters*
  - *SYNLETT*
- Public school outreach

### Elaine A. Vickers

- Public school outreach

### Nathan S. Werner

- Member of *American Chemical Society*
- Reviewer for *Journal of Organic Chemistry*

### Brandon K. Wiggins

- Member of:
  - *American Astronomical Society*
  - *Utah Academy of Sciences, Arts, & Letters*
- Reviewer for:
  - *Astrophysical Journal*
- Public school outreach

### Rhett R. Zollinger

- Member of:
  - *American Astronomical Society*
  - *American Association of Physics Teachers*
  - *Great Basin Observatory Consortium*
  - *Society of Physics Students*
- Public school outreach





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*College of Science & Engineering*