2017-
2018

Walter Maxwell Gibson College of Science and Engineering Annual Report

SUU

ANNUAL REPORT CONTENTS

1. Eight faculty from WMG COSE received significant honors this year. Randall Violett (Assistant Professor of Agriculture) and Laurie Harris (NTT Assistant Professor of Information Systems) received *Teacher of the Year* awards from the Utah Association of Career and Technical Education. Bill Heyborne (Associate Professor of Biology) and Brandon Wiggins (Assistant Professor of Physics) were honored by Lieutenant Governor Cox with *Utah Volunteer Recognition Certificates*. Nate Werner (Assistant Professor of Chemistry) and Dezhi Wu (Associate Professor of Information Systems) obtained *SUU Outstanding Educator* and *SUU Distinguished Educator* awards, respectively. An international team including Sangho Bok (Assistant Professor of Engineering) received a *2017 Microscopy Today Innovation Award*.

2. Our healthcare professional acceptance successes were again strong this year. Data for the 2017-2018 academic year shows that 30 of the 33 WMG COSE applicants were accepted to medical school (with one still on a waitlist); 11 of 14 dental school applicants were successful (with another still on a waitlist); 5 of 7 WMG COSE graduates who applied for pharmacy admissions were accepted; and 7 of 10 occupational therapy candidates were admitted. 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 58/60≈97% for this academic year which again exceeds 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 13th year of cooperation. A total of 46 students graduated with 40 of these receiving an Associate degree from SUU. 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 (67% of SUCCESS graduates continued on to SUU as sophomores) 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 46,067 campers since 1997. This summer Professor Wittwer and her staff conducted twelve separate camp sessions and served 431 elementary students from 9 different states. Another 289 students applied but could not be accepted because of lack of space. More information is available at: http://suu.edu/cose/center/.

6. The College was successful in obtaining numerous grants. The largest interdisciplinary grants include:
   - Through the efforts of Roger Gold (co-PI) the National Science Foundation's *Improving Undergraduate STEM Education Initiative* grant awarded SUU $112,700 over five years (September 2017—September 2022).
   - Although not technically a grant, the State Legislature authorized ongoing funding of $150,000 per year to the *SUU Center for STEM Teaching and Learning* effective July 1, 2017.
   - The annual Carl D. Perkins Career and Technical Education grant to SUU for this year was $124,519. Most of this money is spent through WMG COSE programs.
   - Utah System of Higher Education provided SUU a three year *Quantitative Literacy Completion* grant (July 2016—June 2019). This year's allotment was $105,024.
   - SUU obtained a supplemental Perkins grant of $34,188 for the development of a Certificate of Proficiency in Computer Science. Courses for the certificate will start at SUCCESS Academy in Fall 2018 (pilot program).
   - More external grants are listed in the department summaries of this report.

7. The *9th Annual WMG COSE Undergraduate Research Symposium* was held on November 13, 2017 in the Hunter Conference Center. The keynote speaker was John F. Hurdle, Professor of Biomedical Informatics from the University of Utah. There were 51 posters and 26 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 2017—2018, 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 2017—2018 academic year, the following data were reported:
   - Refereed Scholarly Publications – 20
   - Refereed Presentations at Professional Meetings – 50
   - Books, Reports, and other Documents – 4
   - Externally Funded Grants – 17
   - Special Recognitions and Awards – 8

10. As of July 1, 2018 Chris Monson and Mark Meilstrup were awarded tenure with promotion to Associate Professor. Debra Hanson was promoted to Associate Professor, Non-Tenure Track. Scott Hansen and Dezhi Wu advanced to Full Professor. We note the retirements or resignations of five WMG COSE faculty and acknowledge their efforts on behalf of the College: Megan Boston, Scott Carlile, Mike Grady, Rob Robertson, and Skyler Simmons.

MESSAGE FROM THE DEAN

What a great time to be a T-Bird! As an SUU alumnus, I have always been proud of my alma mater, and have never felt that my educational experience wasn't top drawer. My feelings are being verified in new, and interesting ways, as the Institution moves forward under the leadership of President Wyatt and Provost Cook.

Enrollment reached 10,000 last year, and a goal has been set to enroll 15,000 students by 2025. This kind of rapid growth comes with significant challenges, and we are feeling the pinch in both physical and human resources. Despite the challenges, we in the Walter Maxwell Gibson College of Science and Engineering (WMG COSE), are committed to provide a high quality, high touch, personalized learning experience for our students, not unlike what I enjoyed as an undergraduate.

We have an impressive team of faculty and staff members, and our ranks grow every year as we attempt to meet increasing enrollment. Our faculty is invested in the success of our students, as manifested by the number of research projects mentored, student performance on nationally normed standardized exams, and the number of campus leaders that are drawn from our faculty and staff ranks. Although not a part of the WMG COSE annual report; the University Staff Association President; three Provost's Faculty Fellows; Directors of the Center for Excellence in Teaching and Learning, Science, Technology, Engineering, and Mathematics Education Center, and Undergraduate Research and Scholarship Program; and the Faculty Senate President all hailed from the College during the 2017—2018 academic year.

Our role in supporting student success and campus leadership is well established. As a college, we are committed to the goals of the Institution, and we will continue to flourish in the ever changing environment that we find ourselves immersed in. Despite the challenges, I, personally, am honored to be here at this time in the history of a great school.

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 Center. 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:

- 91% acceptance to medical schools
- 79% acceptance to dental schools
- 70% acceptance to occupational therapy programs
- 71% 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 2017—2018, the following were reported:

- Educational Testing Service (ETS) Major Field Exams
  - Chemistry–76th percentile student average
  - Biology–49th percentile student average
  - Computer Sci–57th percentile student average
  - Math–62nd percentile student average
- American Chemical Society (ACS) end-of-course exams –73rd percentile student average
- Geology ACAT exam–93rd percentile
- Fundamentals of Engineering exam 100% pass rate
- NCLEX national standardized nursing licensure exam
  - 100% pass rate for Fall 2017
  - 93% pass rate for Spring 2018

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 2017—2018

- 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 9th 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 2017-18

- The long driveway to the Ashcroft Observatory has been paved, facilitating easy public access.
- The fluid dynamics lab obtained a large wind tunnel.
- A metal 3D printer (additive manufacturing) has been purchased, facilitating rapid prototyping and manufacture of one-of-a-kind metal items.
- The large lab TH 106 has been re-purposed as a "maker space" for close collaboration with local industry.

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 2017—2018.
- 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 431 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.

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 as 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 promote 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

The mission of the nutrition program is to involve students in meaningful educational experiences that provide the tools necessary to succeed as professionals in a wide range of health science careers. This is accomplished by providing opportunities for original research, promoting engagement in the surrounding community, supporting real-life application through coursework, and encouraging the retrieval and dissemination of evidence-based information regarding health and nutrition across the lifespan.

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. Violett	Assistant Professor	Range Science	2012
Dean L. Winward	Associate Professor	Agriculture	1990
Lee G. Wood	Associate Professor, Department Chair	Animal Science	2000

Productivity Highlights 2017—2018

Scholarly Presentations at Professional Meetings

Gasser, C.L.; "Fetal programming: effects of nutrition during gestation on offspring performance" *10th Annual Cowman's Reproduction Workshop*, 19 September 2017, Alton UT

Grady, A.P.; Schmidt, M.C.; *et al* "Acceptability and knowledge of hemp seed as a dietary source of ALA" *Academy of Nutrition and Dietetics: Food and Nutrition Conference and Expo*, 21 October 2017, Chicago IL

Lyman, C. "Achieving professional respect and credibility" *Utah Academy of Nutrition and Dietetics Annual Conference*, 30 March 2018, Salt Lake City UT

Schmidt, M.C.; Grady, A.P.; *et al* "College students' knowledge and misconceptions of the caloric value of foods" *Academy of Nutrition and Dietetics: Food and Nutrition Conference and Expo*, 21 October 2017, Chicago IL

Schmidt, M.C.; Bone, K.; Glazier, D. "College-aged women's knowledge and perceptions of prenatal supplements" *Academy of Nutrition and Dietetics: Food and Nutrition Conference and Expo*, 21 October 2017, Chicago IL

Winward, D.L. "Dixie National Forest invasive weed control and management" *UT/AZ Invasive Weed Update Meeting*, 12 December 2017, Cedar City UT

Honors, Awards and Special Recognition

Randall D. Violett

- *Utah Association of Career and Technical Education (UACTE)*, Post-Secondary Teacher of the year 2017—2018

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*
  - *Utah Association of Family and Consumer Sciences*
- 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*
  - *International Federation of Eating Disorder Dietitians*
- Regional Dietitian consultant
- Public school outreach

Matt C. Schmidt

- Regional nutrition consultant

Professional Memberships & Community Service (continued)

Billie Jean Sessions

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

Randall D. Violett

- Member of:
  - *ACTE*
  - *NACTA*
  - *NAAE/UAAE*
  - *Society for Range Management*
  - *Western Society of Weed Science*
- Recipient of:
  - Iron County Restaurant Tax Cooperative grant for FFA ($3000)
  - Utah Native Plant Society grant ($200)
- 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
Ryan C. Barney	Lecturer, Non-Tenure Track	Criminal Forensics	2016
Rachel Bolus	Assistant Professor	Evolutionary Biology	2016
Helen C. Boswell	Associate Professor	Evolutionary Biology	1999
Carrie Jo Bucklin	Assistant Professor	Biology Education	2016
Jay Lance Forshee	Assistant Professor	Anatomy, Physiology	2017
Roger S. Gold	Associate Professor	Microbiology	2016
Fredric R. Govedich	Associate Professor, Department Chair	Zoology, Entomology	2006
Jacqualine B. Grant	Associate 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 J. Jarvis	Lecturer, Non-Tenure Track	Molecular Ecology	2016
Jonathan E. Karpel	Associate Professor	Cellular/Molecular Biology	2010
Laurie A. Mauger	Assistant Professor	Genetics	2011
Jennifer Mraz-Craig	Lecturer, Non-Tenure Track	Anatomy, Physiology	2017
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	Associate Professor	Neurobiology	2011
Samuel Wells	Lecturer, Non-Tenure Track	Entomology	2015

Productivity Highlights 2017—2018

Scholarly Presentations at Professional Meetings

*Garrison-Tovar, P.; *James, J.; *Shepherd, D.; Bolus, R.T. "Evolution of birdsong along a noise pollution gradient" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

Forshee, J.L. "Creating the chemistry in cellular respiration concept inventory" *2nd Annual Intermountain Teaching for Learning Conference*, 16 March 2018, Henderson NV

Grant, J.B.; Terrell, K. "Civic engagement in conservation biology" (workshop) *International Congress for Conservation Biology*, 25 July 2017, Cartagena Colombia

Grant J.B. "Restoration: research and education partnership between the Colorado Plateau Native Plant Program and Southern Utah University" *14th Biennial Conference of Science & Management*, 12 September 2017, Flagstaff AZ

Belk, J.; Roper, L.K. "Body of work: OER in an integrated anatomy and first-year writing class" *Utah: the State of OER Conference*, 23 February 2018, Sandy UT

*Albrecht, J.M.; *Orme, B.; Tufte, M.J.; Weeg, M.S. "The effect of terpinen-4-ol on blood vessel diameter in frogs" *Utah Conference on Undergraduate Research*, 9 February 2018, Provo UT

Documents, Books, and other Publications

Bolus, R.T. *et al* "Extending the habitat concept to the airspace" Chapter 3 in *Aeroecology*, Chilson, P.; Frick, W.F.; Kelly, J.; Liechti, F. editors. Springer, New York, NY 2017 ISBN 978-3-319-68576-2

Scholarly Articles

Bolus, R.T.; *et al* "Swainson's Thrushes do not show strong wind selectivity prior to crossing the Gulf of Mexico" *Scientific Reports* 7 (2017) Article 14280

Bolus, R.T.; *et al* "Occurrence of quiescence in free-ranging migratory songbirds" *Behavioral Ecology and Sociobiology* 72 (2018) Article 36

Bucklin, C.J.; Daniel, K.L. "Using word associations as a formative assessment for understanding phylogenies" *American Biology Teacher* 79 (2017), 668—670

Grant, J.B.;† MacLean J.S. "Semester in the Parks: engaging students with common intellectual experiences" *Journal on Empowering Teaching Excellence* 2 (2018) Article 6

Heyborne, W.H.; *Gardner, C.; *Kemme, B.A. "*Smilisca baudinii* (Mexican Treefrog) and *Incilius luetkenii* (Yellow Toad), interspecific amplexus" Natural History Notes in *Herpetological Review* 49 (1) (2018), 101

Heyborne, W.H.; *et al* "*Thamnophis elegans vagrans* (Wandering Gartersnake) melanistic coloration" Natural History Notes in *Herpetological Review* 49 (1) (2018), 141

Taylor, J.R.; *et al* "High-impact practices for regional reform in Utah" *Peer Review* 19 (3) (2017), 20—21

Honors, Awards and Recognition

Jacqualine B. Grant
- SUU Board of Trustees Award of Excellence
- SUU Thunderbird Professor of the Year

William H. Heyborne
- Utah Commission on Service & Volunteerism Volunteer Recognition Certificate

* indicates SUU student co-author

† faculty in SUU Department of Physical Science

External Grants

Roger S. Gold (co-PI)
- *Improving Undergraduate STEM Education Initiative* (*NSF IUSE*) "From discovery to market: integrating interdisciplinary skills through a collaborative research based lab curriculum" September 2017—September 2022 ($112,700 for SUU portion)

Jacqualine B. Grant (PI)
- *CPCESU (BLM)* "Heritage Resources", April 2018—September 2018 ($23,000)

Laurie A. Mauger (faculty mentor for three students)
- *TriBeta (BBB) Research Grants* November 2017—May 2018 ($1150 in total)

William H. Heyborne, (PI)
- *BLM* "Utah reptile and amphibian inventory and monitoring", September 2017—September 2018 ($30,000)
- *Utah STEM Education Center* ongoing funding, July 2017—June 2018 ($150,000)

Professional Consulting

Jaqualine B. Grant
- Exhibit planner: *Nat Hist Museum of Utah* (*gratis*)

R. Matthew Ogburn
- Botanist for *Zion Canyon Field Institute* ($600)

John R. Taylor
- Professional development seminars for *Partnership for Effective Science Teaching & Learning* ($1500)

Professional Memberships and Community Service

Rachel T. Bolus
- Member of:
  - *American Ornithological Society*
  - *Wilson Society of Ornithology*
- Public school outreach

Helen C. Boswell
- Public school outreach

Carrie Jo Bucklin
- Member of *National Assoc of Biology Teachers*
- Public school outreach
- Reviewer for
  - *Water Resources Research Institute*
  - *NABT*
  - *NARST*
  - *Journal of Geoscience Education*

Lance Forshee
- Member of:
  - *NABT*
  - *HAPS*
  - *Sigma Xi Honor Society*
- Reviewer for *The American Biology Teacher*
- Public school outreach

Roger S. Gold
- Member of *American Society for Microbiology*
- Public school outreach

Fredric R. Govedich
- Editor or reviewer for:
  - *Biodiversity Data Journal*
  - *NSF Graduate Research Fellowship* program
  - *Southwestern Naturalist*
  - *ZooKeys*
- Volunteer for:
  - *Cedar Breaks BioBlast Weekend*
  - *Boy Scouts of America*

Jacqualine B. Grant
- Administrative member of:
  - *Society of Conservation Biology*
- Public school outreach

Debra A. Hanson
- Public school outreach

Professional Memberships and Community Service (continued)

William H. Heyborne
- Member and/or reviewer for:
  - *American Malacological Society*
  - *Computers in Education*
  - *National Association of Biology Teachers*
  - *National Science Teachers Association*
  - *Society for the Study of Amphibians & Reptiles*
  - *The American Biology Teacher*
  - *Utah Science Teachers Association*
- Public school outreach

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

Jonathan E. Karpel
- Public school outreach

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

Jennifer Mraz-Craig
- Member of:
  - *Human Anatomy & Physiology Society*
  - *National Association of Biology Teachers*
- Public school outreach

R. Matthew Ogburn
- Member of:
  - *American Society of Plant Taxonomists*
  - *Botanical Society of America*
  - *Ecological Research as Education Network*
- Public school outreach

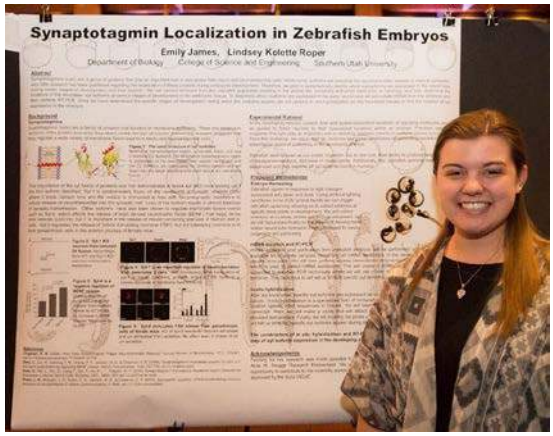
Lindsay K. Roper
- Member of *Tri-Beta Honor Society*

John R. Taylor
- Public school and *NPS* outreach
- Board Member of:
  - *Utah Science Teachers Association*
  - *Zion National Park Forever Project*

Mary Jo Tufte
- In-service triage training for:
  - 222nd *Field Artillery Regiment*
  - *Classic Air Medical Search & Rescue Services*
- Public school outreach

Matthew S. Weeg
- Member of *The American Physiological Society*

Samuel Wells
- Member of:
  - *California State Collection of Arthropods*
  - *Coleopterists Society*
  - *Entomological Society of America*
  - *Los Angeles County Museum*
  - *Society of Freshwater Science*
- Editor or reviewer for:
  - *The Southwest Naturalist*
  - *NEARA*
  - *Zootaxa*
- Volunteer for *Cedar Breaks BioBlast Weekend*



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.

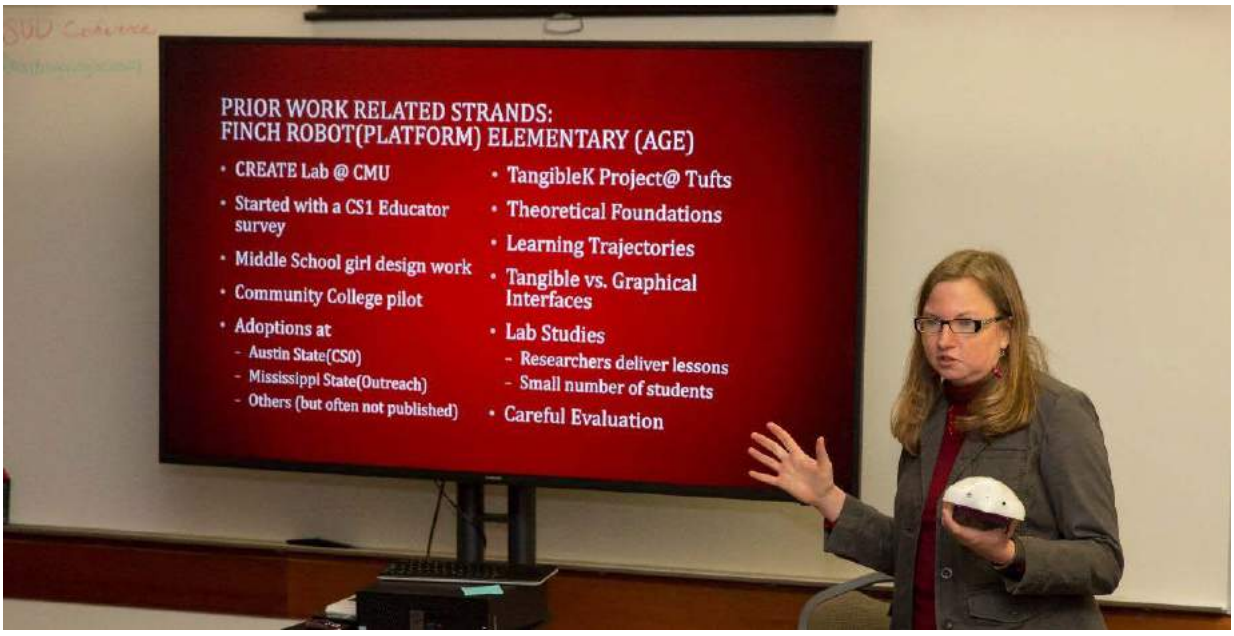
Special Accreditation

ABET | Computing Accreditation Commission

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
Joshua Meredith	Lecturer, Non-Tenure Track	Computer Literacy	2016
Robert A. Robertson	Associate Professor, Department 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 2017—2018

Scholarly Presentations at Professional Meetings

Barker, N.; Harris, L. "A survey of digital literacy in General Education degree requirements at Southern Utah University peer institutions" *4th Annual Conference on Computational Science & Computational Intelligence*, 15 December 2017, Las Vegas NV

Heiner, C. "A robotics experience for all the students in an elementary school" *49th ACM Technical Symposium on Computer Science Education*, 22 February 2018, Baltimore MD

Kesar, S. "Experiential education pedagogy: using eight principles of good practice for the capstone class" *Experiential Learning Leadership Institute*, 26 June 2018, Flagstaff AZ

Kesar, S.; *et al* "Research grants and agreements: how to get them and keep them" *Experiential Learning Leadership Institute*, 27 June 2018, Flagstaff AZ

Tadayon, N.; *et al* "Neural network application in detecting breast cancer by removing outliers" *20th International Conference on Artificial Intelligence*, 31 July 2018, Las Vegas NV

Wu, D.; *Brown, S.; *Christensen, Z.; *Cox, C.; *Isom, M.; *Jared, M.; *Porter, J. "Learn by team play: engaging youngsters to STEM fields" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

* indicates SUU student co-author

Scholarly Articles

Heiner, C. "Coding, collaborating, and creating a trio of pedagogical practices to improve instruction and retention in CS 1" *Journal of Computing Sciences in Colleges* 33 (2017), 93—99

External Grants

Cecily Heiner, *et al*
- *NCWIT Aspire IT* "Southern Utah coding for girls" January—February 2018 ($2000)

Shalini Kesar
- *NCWIT Aspiration Award SEED grant* ($2500)
- *Utah Women's Giving Circle* "Creating a pipeline of young women in computing" ($2000)

Robert A. Robertson
- Perkins CTE "Development of a CS Certificate" May—August 2018 ($34,188)

Honors, Awards and Special Recognition

Laurie L. Harris
- 2018 UACTE IT Teacher of the Year

Dezhi Wu
- 2018 SUU Distinguished Educator Award

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
- Public school outreach

Michael J. Grady
- Member of:
  - *Association for Computing Machinery*

Laurie L. Harris
- Member of:
  - *ACTE*
  - *UACTE*
  - *National Business Education Association*

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

Shalini Kesar
- Editor/reviewer for:
  - *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 *SW Tech* Advisory Board
- Reviewer for *USTAR*

Nasser Tadayon
- *Code Camp* judge
- Member of:
  - *Association for Computing Machinery*
  - *IEEE*
  - Utah *State Computer Proficiency Task Force*

Dezhi Wu
- Member of:
  - *Association for Computing Machinery*
  - *Association of Information Systems*
- Public school outreach
- Organizer for:
  - *ICIS 2018* conference
  - *HCII 2018* conference
- Reviewer for:
  - *ACM Conference on Human Computer Interaction*
  - *AIS Transactions on Human Computer Interface*
  - *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

ABET 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

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.

ABET Engineering Technology Accreditation Commission

The Engineering Technology Bachelor Degree (excluding CAD/GIS 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	Assistant Professor	Electrical Engineering	2016
Megan Boston	Visiting Assistant Professor	Mechanical Engineering	2017
Isabella M. Borisova	Assistant Professor, Non-Tenure Track	Electronics and Computer Technology	2011
Scott Carlile	Lecturer, Non-Tenure Track	Electronics Technology	2017
Richard K. Cozzens	Associate Professor	2D and 3D Design	2001
Roger A. Greener	Professional Staff	Computer Aided Manufacturing (CAM)	1990
L. Scott Hansen	Associate Professor, Department Chair	Technology Education	2007
Scott E. Munro	Associate Professor, Associate Department Chair	Aerospace Engineering, Acoustics	2015
Matthew Roberts	Professor	Civil Engineering	2014
Ali S. Siahpush	Associate Professor	Mechanical Engineering, Thermodynamics	2015

Productivity Highlights 2017—2018

Scholarly Presentations at Professional Meetings

Bok, S.; *et al* "Synthesis and characterization of a 3D-macroscale RGO/Al/Bi2O3 nanoenergetic organogel" *Materials Research Society Fall Meeting & Exhibit*, 30 November 2017, Boston MA

Bok, S.; *et al* "Laser ignition on aluminum-polymer nanoenergetic systems using plasmonic gratings" *Materials Research Society Fall Meeting & Exhibit*, 28 November 2017, Boston MA

Bok, S.; *et al* "Extending lipoarabinomannan detection limitations with plasmonic gratings" *IEEE Sensors 2017*, 30 October 2017, Glasgow Scotland

Bok, S.; *et al* "Graphene-based Al-Bi2O3 nanoenergetic films by electrophoretic deposition", *IEEE 12th Nanotechnology Materials and Devices Conference*, 3 October 2017, Singapore

Boston, M.; Mitrani-Reiser, J. "Comparing resilience rating systems: assessing post-earthquake hospital functionality" *11th US National Conference on Earthquake Engineering*, 26 June 2018, Los Angeles CA

Haden, C.; Roberts, M.W. "Civil engineering students' views on infrastructure in the US" *ASEE Annual Conference*, 25 June, Salt Lake City UT

Roberts, M.W. "Fostering reflection and metacognition with engineering homework," *ASEE Rocky Mountain Section Annual Conference*, 22 September 2017, Provo UT

Documents, Books, and other Publications

Hansen, L.S. "Autodesk Inventor 2019—A Tutorial Introduction", *SDC Publications* 2018. ISBN 978-1630-571696

Scholarly Articles

Bok, S.; *et al* "Fluorescence based temperature sensor for anomalous heat from loaded palladium electrodes with deuterium or hydrogen" *Journal of Condensed Matter Nuclear Science* 24 (2017), 25—31

Bok, S.; *et al* "In situ characterization of photothermal nanoenergetic combustion on a plasmonic microchip" *ACS Applied Materials & Interfaces* 10 (2018), 427—436

Munro, S.E.; *et al* "A study of solid ramjet fuel containing boron-magnesium mixtures" *Journal of Propulsion and Power Research* 6 (2017), 243—252

External Grants

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

- *NSF Division of Undergraduate Education* "Training next generation faculty", September 2013—July 2018 ($20,536 for total SUU portion)

Scott Munro, Ali S. Siahpush

- *NASA/ Utah Space Grant Consortium* "Experimental Sounding Rocket Project", July 2017—June 2018 ($16,000)

Honors, Awards and Special Recognition

Sangho Bok, *et al*
2017 Microscopy Today Innovation Award "Plasmonic gratings to replace glass slides enabling cost-effective sub-diffraction-limited images"

Professional Consulting

Scott E. Munro

- Acoustic system development for *Naval Air Warfare Center* (*USN*) September—October 2017 ($300)
- Documentation and review for *Naval Air Warfare Center* (*USN*) April—May 2018 (*gratis*)

Professional Memberships and Community Service

Sangho Bok
- Member of:
  - *ASEE*
  - *IEEE*
  - *Sigma Xi Society*
- Reviewer for:
  - *Journal of Electrochemical Society*
  - *Photonics and Nanostructures*

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

Megan Boston
- Member of Earthquake Engineering Research Institute

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

Scott E. Munro
- Reviewer for *Strategic Environmental Research and Development Program* (*US DoD*)
- Public school outreach

Matthew W. Roberts
- Member/reviewer for:
  - *ASCE*
  - *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 Journal*
- Board member of
  - *Utah NASA Space Grant Consortia*
  - *Idaho NASA Space Grant Consortia*

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	Assistant Professor, Non-Tenure Track	Math Literacy	2012
Seth G. Armstrong	Professor	Partial Differential Equations	2001
Saïd Bahi	Professor	Operations Research	2001
Bryan L. Bradford	Lecturer, Non-Tenure Track	Math Literacy	2013
James P. Brandt	Associate Professor, Department 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	Partial Differential Equations	2005
Derek W. Hein	Associate Professor	Combinatorial Design Theory	2004
Jana R. Lunt	Associate Professor	Math Education	2010
Gretchen R. Meilstrup	Associate Professor	Algebraic Geometry	2008
Mark H. Meilstrup	Assistant Professor	Geometric Group Theory	2011
Andrew F. Misseldine	Assistant Professor	Representation Theory	2014
Emma L. Schafer	Assistant Professor	Finite Group Theory	2012
Benjamin Schoonmaker	Lecturer, Non-Tenure Track	Ring Theory	2017
Skyler Simmons	Visiting Assistant Professor	Dynamical Systems	2016
Joshua Tymkew	Lecturer, Non-Tenure Track	Algebraic Geometry	2017
Andreas J. Weingartner	Professor	Number Theory, Actuarial Science	1999
Cecilia L. Weingartner	Lecturer, Non-Tenure Track	Numerical Methods	2008

Productivity Highlights 2017—2018

Scholarly Presentations at Professional Meetings

Armstrong, S.G. "An unconditionally stable numerical scheme for a competition system Involving diffusion terms" *MAA Intermountain Section Meeting,* 23 March 2018, Logan UT

Bahi, S. "Technical analysis: some mathematical tools used to analyze stock prices direction" *MAA Intermountain Section Meeting,* 24 March 2018, Logan UT

Bradford, B.L. "Using Desmos to explore function transformations and modeling" *MAA Intermountain Section Meeting,* 23 March 2018, Logan UT

Freden, E.M. "Aspects of growth in Baumslag-Solitar groups" *Groups St Andrews in Birmingham*, 7 August 2017, Birmingham UK

Hein, D.W. "Cyclic decompositions of λK_n into LWO graphs" *31st Midwest Conference on Combinatorics and Combinatorial Computing*, 21 October 2017, Carrollton GA

Hein, D.W. "Cyclic decompositions of λK_n into LWO graphs" *MAA Intermountain Section Meeting,* 23 March 2018, Logan UT

Han, J. "A semi-implicit difference scheme for a reaction diffusion Brusselator system" *MAA Intermountain Section Meeting,* 24 March 2018, Logan UT

Misseldine, A.F. "The mathematics of Mario Party 10" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

Misseldine, A.F. "Using open pedagogy in an upper division mathematics course" *Utah: The State of OER Conference*, 23 February 2018, Sandy UT

*Bastian, N.; *Brewer, J.; Misseldine, A.F. "Classifying the Schur Rings over the Integers" *MAA Intermountain Section Meeting,* 23 March 2018, Logan UT

[*] Indicates SUU student co-author

Scholarly Presentations at Professional Meetings (cont.)

Weingartner, A.J. "The degree distribution of polynomial divisors over finite fields" *Mathematical Congress of the Americas*, 27 July 2017, Montreal CA

Weingartner, A.J. "On the constant factor in several asymptotic estimates" *West Coast Number Theory*, 19 December 2017, Pacific Grove CA

Weingartner, C.L. "OER promoting deep learning" *Utah: The State of OER Conference*, 23 February 2018, Sandy UT

Scholarly Articles

Weingartner, A.J. "A sieve problem and its application" *Mathematika* 63 (2017), 213—229

Shparlinski, I.; Weingartner, A.J. "An explicit polynomial analogue of Romanoff's theorem" *Finite Fields and their Applications* 44 (2017), 22—33

External Grants

Eric M. Freden (PI)
- *Carl D. Perkins Career and Technical Education* July 2017—June 2018 ($124,519)

Emma L. Schafer (PI)
- *Utah System of Higher Education* Quantitative Literacy Completion, July 2016—June 2019 ($105,024 for this year)

Professional Consulting

Eric M. Freden
- Math consulting for *Casino Game Maker* ($305)

Derek W. Hein
- Math content production for *Red Gate Education Services LLC* ($13,300)

Andrew F. Misseldine
- Math curriculum and textbook consulting for several publishers ($378)

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
- Associate Fellow of *The Institute of Combinatorics and its Applications*
- Member of *Mathematical Association of America*
- Reviewer for:
  - *MathSciNet*
  - *College Board CLEP Calculus Test*

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

Emma L. Schafer
- Public school outreach
- Member of *Mathematical Association of America*

Andreas J. Weingartner
- Member of *American Mathematical Society*
- Reviewer for
  - *Finite Fields and their Applications*
  - *Mathematika*
  - *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
Sharon L. Ford	Lecturer, Non-Tenure Track	Medical/Surgical Nursing	2017
Elizabeth A. Hatfield	Professional Staff	Nursing Lab Specialist	2002
Selwyn Layton	Assistant Professor	Nursing Education	2009
Donna J. A. Lister	Associate Professor, Department Chair	Clinical Nursing	2005
SheriDawn Neilson	Assistant Professor, Non-Tenure Track	Critical/Trauma Care	2015
Bree Rayburn	Assistant Professor, Non-Tenure Track	Maternal & Newborn Nursing	2016
Kevin D. Tipton	Assistant Professor	Geriatric Nursing	2006
Lauren Traveller	Assistant Professor	Forensics, Mental Health	2017
Loni Wright	Assistant Professor, Non-Tenure Track	Medical/Surgical Nursing	2018

Productivity Highlights 2017—2018

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*
  - *Sigma Theta Tau International*
  - *SW Tech Occupational Advisory Committee*
  - *Utah Nurse Practitioners Association*
- Public school outreach
- Volunteer for *Canyon Creek Women's Crisis Center*

Sharon Ford

- Member of *National League of Nursing*
- Public school outreach

Selwyn Layton

- Member of:
  - *American Association of Critical Care Nursing*
  - *American Nurses Association*
  - *Cedar City Hospital Practice Council*
  - *Emergency Nurses Association*
  - *National League of Nursing*
  - *Sigma Theta Tau International*
  - *Utah Nurses Association*
- Medical volunteer for *Utah Summer Games*

Donna J. A. Lister
- Member of:
  - *Academic Leadership Committee*
  - *American Association of Nurse Practitioners*
  - *American Nurses Association*
  - *Cedar City Hospital Board*
  - *National League of Nursing*
  - *SW Region Clinical Coordination Council*
  - *Utah Board of Nursing Peer Education Review Committee*
  - *Utah Nurses Association*
  - *Utah Nursing Consortium*
  - *Utah Nurse Practitioners Association*

SheriDawn Neilson
- Member of:
  - *Classic Air Medical* Quality Assurance Team
  - *National League of Nursing*
  - *Sigma Theta Tau International*
  - *Utah Nurses Assocation*
- Medical volunteer *Cedar City Temple* Open House
- Public school outreach

Bree Rayburn
- Member of:
  - *American Nurses Association*
  - *Cedar City Hospital Practice Council*
  - *National League of Nursing*
  - *Sigma Theta Tau International*
- Medical volunteer for *Utah Summer Games*

Lauren Traveller
- Member of:
  - *American Academy of Forensic Sciences*
  - *American Association of Nurse Practitioners*
  - *Cedar City Hospital Board of Trustees*
  - *International Association of Forensic Nurses*
  - *National League of Nursing*
  - *Nevada Advanced Practice Nurse Association*

Kevin D. Tipton
- Member of:
  - *American Nurses Association*
  - *Cedar City Hospital ER Council*
  - *Emergency Nurses Association*
  - *Mothers Against Drunk Driving*
  - *National League of Nursing*
  - *Utah Organization for Nurse Leaders*
  - *Utah Nurses Association*

Loni Wright
- Member of:
  - *National League of Nursing*
  - *Utah Nurses Association*
  - *Milford Hospital Policy Committee*
  - *SW Tech LPN Program Advisory Board*

Scholarly Presentations at Professional Meetings

Tipton, K.D. "Health care professionals and the opioid crisis" *HealthInsight Quality Conference*, 1 November 2017, West Valley City UT

Department of Physical Science

Mission Statement

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

Programs and Degrees Offered

BACHELOR DEGREES

BA/BS Physical Science 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 officially approved by the ACS.

Departmental Faculty

Faculty	Rank	Specialty	Year Began at SUU
Kristina B. Bronsema	Professional Staff	Lab Specialist	1997
Jacob C. Dean	Assistant Professor	Physical Chemistry	2017
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	Professor	Geography	1994
John S. MacLean	Associate 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, Department Chair	Organic Chemistry	1990
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
Casey Webb	Lecturer, Non-Tenure Track	Geology	2018
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 2017—2018

Scholarly Presentations at Professional Meetings

*Staheli, C.; *Rico, K.; Dean, J.C. "Spectroscopic and quantum chemical investigation of nature's most adaptive photosynthetic pigments" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

Kaiser, J.F. "Teaching geology in Southern Utah University's Jumpstart General Education program: making geology accessible to non-scientists through collaborative teaching and learning" *Geological Society of America Annual Meeting*, 24 October 2017, Seattle WA

*Deane, C.; *Freeman, J.; Helms, R.; MacLean, J.S.; *Starr, Z.; *McPherson, G. "Learning through doing: NCHC student publishing with UReCA" *National Collegiate Honors Council*, 10 November 2017, Atlanta GA

MacLean, J.S.; *et al* "NCHC Partners in the Parks" *National Collegiate Honors Council*, 10 November 2017, Atlanta GA

*Clayson,M.; *Harkness, E.; *Koehler, A.; *McKay, S.; *Miller, L.; Monson, C.F.; *Shumway, M. "A microfluidic device for oxygen quantitation in anoxic environments" *iUtah Annual Symposium & Summer All-Hands Meeting*, 13 July 2017, Logan UT

*Brown, M; Monson, C.F.; *Radmall, K.; *Radmall, R. "Silver nanoparticle synthesis with microfluidic devices" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

*Harmon, M.; Pierce, E.; Weaver, K.H. "Using the chemical composition of Coal Creek to better understand the lack of biodiversity" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

*Ipsen, S.; *Edwards, P.; Weaver, K.H. "Soil analysis of molybdenum metal near Milford, UT" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

Smidt, J.; Wiggins, B.K. "Cosmological simulations with molecular astrochemistry: water in the early universe" *231st National Meeting of the American Astronomical Society*, 10 January 2018 Washington DC

*Gamble, T.; Wiggins, B.K. "Sun fire on Earth: the hydrodynamics of kiloton explosions" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

*Christensen, K.; *Christensen, P.; Wiggins, B.K. "Tidal disruption events around massive black holes" *Annual Conference of the Utah Academy of Sciences, Arts and Letters*, 7 April 2018, Cedar City UT

Honors, Awards and Special Recognition

Nathan S. Werner
- SUU 2017-2018 Outstanding Educator

Brandon K. Wiggins
- Utah Commission on Service & Volunteerism Volunteer Recognition Certificate

External Grants

David J. Maxwell
- *Forest Service (USDA)* GIS software support, September 2017—May 2017 ($1250)
- *Kolob IR* software grant Fall 2017 ($1500)
- *Natel Energy Inc* GIS support, May 2017—October 2017 ($30,000)

Brandon K. Wiggins, Joseph Smidt (PI)
- *Los Alamos National Laboratory "Massive Black Hole Formation", Summer 2018 ($32,648 SUU portion)*

*indicates SUU student co-author

Scholarly Publications

Dean, J.C.; Scholes, G.D. "Coherence spectroscopy in the condensed phase: insights into molecular structure, environment, and interactions," *Accounts of Chemical Research* 50 (2017), 2746—2755

Pierce, E.; *et al* "Accessing chemical diversity from the uncultivated symbionts of small marine animals" *Nature Chemical Biology* 14 (2018), 179—185

Pierce, E.; *et al* "Properties of intermediates in the catalytic cycle of oxalate oxidoreductase and its suicide inactivation by pyruvate" *Biochemstry* 56 (2017), 2824—2835

*Maedgen, R.l.; *Pereira, M.R.; Werner, N.S. "Diastereoselectivity of the nucleophilic addition reaction of the (±)-menthylmagnesium chloride Grignard reagent with phenyl isocyanate" *Journal of the Utah Academy* 94 (2018), 227—334

Wiggins, B.K.; *et al* "The supernova analysis package SNAP" *The Astrophysical Journal* 846 (2017), Article 101

*Taylor, M; Wiggins, B.K. Smoothed particle hydrodynamics simulations of proto-planetary collisions in the early solar system" *Journal of the Utah Academy* 94 (2018), 347—357

Zollinger, R.R.; *et al* "Exomoon habitability and tidal evolution in low-mass star systems" *Monthly Notices of the Royal Astronomical Society* 472 (2017), 8—25

Documents, Books, and other Publications

Kaiser, J.F. *Natural Hazards and Disasters: The Interaction of Geology and People*, Great River Learning 2017. ISBN 978-1680754292

Vickers, E.B.; Caldwell, R. "Liberal Arts Reading Strategies for the High School and University Chemistry Classroom" chapter 9 in *Liberal Arts Strategies for the Chemistry Classroom*, Kloepper & Crawford (editors), ACS Symposium Series eBooks, American Chemical Society 2017. ISBN 978-0841232617

* indicates SUU student co-author

Professional Consulting

David J. Maxwell
- *Iron County* parcels database project ($5000)
- *Brianhead* GIS parcel lot/block calculations ($500)
- *UGS* -mapping and cartography SW quarter of the Beaver 30x60 Quadrangle ($1500)
- *Kolob* infrared thermal sensor for Airborne Wildfire Field Collection ($7200)

Christopher F. Monson
- Textbook reviewer for *Sapling Learning* ($400)

Mackay B. Steffensen
- Textbook reviewer for *Top Hat* ($50)

Rhett R. Zollinger
- Planetarium presentations for the *49th Annual Division for Planetary Sciences Meeting* ($200)

Professional Memberships and Community Service

Jacob C. Dean
- Member of *American Chemical Society*
- Reviewer for *Chemical Physics*
- Public school outreach

Daniel J. Eves
- Member of *National Science Teachers Association*
- Public school outreach

Robert L. Eves
- Member of *American Association of Petroleum Geologists*

Bruce R. Howard
- Member of:
  - *AAAS*
  - *American Chemical Society*
- 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*
  - *Utah Geological Association*

Professional Memberships and Community Service (cont.)

Paul R. Larson
- Member of:
  - *American Association of 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*
  - *Utah Geological Association*
  - *National Collegiate Honors Council*

David J. Maxwell
- Member of:
  - *Utah Geographic Information Council*
  - *Five Counties GIS User Group*
- Mapping of LDS ward boundaries

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

Elizabeth Pierce
- Public school outreach

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

J. Ty Redd
- Member of *American Chemical Society*
- Water quality education outreach

Matthew Rowley
- Public school outreach

Hussein A. Samha
- Public school outreach

Grant Shimer
- Member of *Sigma Gamma Epsilon*
- Fossil identification public outreach

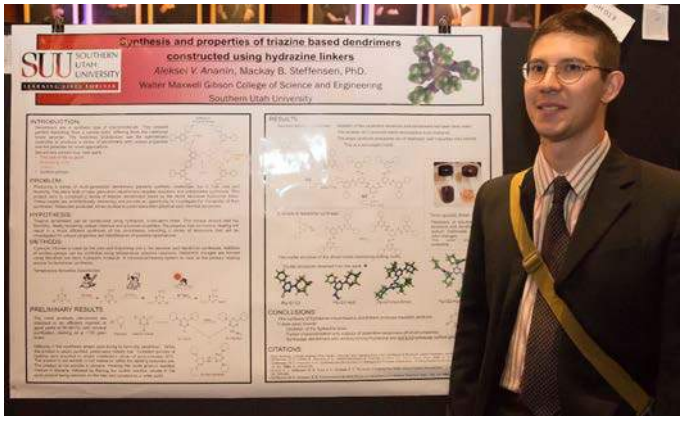
Mackay B. Steffensen
- Member of:
  - *American Chemical Society*
  - *UCUR Steering Committee*
- Public school outreach

Elaine A. Vickers
- Public school outreach

Nathan S. Werner
- Member of *American Chemical Society*
- Reviewer for *European Journal of Medicinal Chemistry*
- Public school outreach

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*
  - *Sigma Pi Sigma*
  - *Society of Physics Students*
- Public school outreach



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WALTER MAXWELL GIBSON
COLLEGE OF SCIENCE & ENGINEERING

College of Science & Engineering
351 W. University Blvd.
Cedar City, UT 84720
435-586-7920 • fax: 435-865-8550
www.suu.edu/cose