

Artis College of Science and Technology Annual Report for 2017-2018

The College of Science and Technology (CSAT) at Radford University (RU) was formed on July 1, 2007 by combining the Departments of Biology, Chemistry and Physics, Geology, and Mathematics and Statistics from the former College of Arts and Sciences and the Department of Information Technology from the former College of Information Science and Technology. On July 1, 2009, the Anthropology and Geography programs from the College of Humanities and Behavioral Science joined the CSAT, and on November 11, 2011, independent departments of Anthropological Sciences, Geology, Geospatial Science and Physics were formed. Anthropology was approved by SCHEV to become the Anthropological Sciences program on May 10, 2010, and Geography was approved by SCHEV to become the Geospatial Science program on May 17, 2011. On April 28, 2017, the CSAT was renamed the Artis College of Science and Technology in honor of Dr. Pat and Mrs. Nancy Artis '73, who donated \$5 million to establish the Artis Endowed Scholarship Fund to provide scholarships to ACSAT majors.

MISSION

The Artis College of Science and Technology prepares students with skills and expertise essential to the Commonwealth and the nation. The College emphasizes the theory and applications of science, mathematics, and technology. The College develops students' creative and critical thinking skills and teaches students to analyze problems and implement solutions to a vast array of challenges in our local, national and global communities. Students will be prepared to bring creative and socially responsible innovations to the workplace and to society.

DEGREES AND CONCENTRATIONS IN 2017-18

- B.A. and B.S. in Anthropological Sciences with concentrations in General Anthropology, Field Archaeology and Forensic Anthropology
- B.S. in Biology with concentrations in General Biology and Medical Laboratory Sciences
- B.S. in Chemistry with concentrations in Professional Chemist, Advanced Professional Chemist, Biochemistry: Life Sciences and Pre-Health, Advanced Biochemistry and Forensics as well as an Environmental Science option
- B.S. in Computer Science and Technology with concentrations in Computer Science, Database, Software Engineering and Networks
- M.S. in Data and Information Management
- B.S. in Geology with concentrations in General Geology, Engineering and Environmental Geosciences and Earth Sciences
- B.A. and B.S. in Geospatial Science with concentrations in Environmental and Geoinformatics
- B.S. in Information Science and Systems with concentrations in Information Systems, Healthcare Information Systems, Information Systems Design Science, Information Systems Security and Web Design
- B.A. and B.S. in Mathematics with concentrations in Applied Mathematics, Statistics and Traditional Mathematics
- B.A. and B.S. in Physics with concentrations in Physics, Biophysics, Earth and Space Science and Physics Education

GOALS AND ACCOMPLISHMENTS FOR 2017-2018

These goals are based on the roles and responsibilities of deans as described in section 4.1.3.1 on page 62 of the Radford University Teaching and Research Faculty Handbook.

- to lead the faculty and staff of the college in developing and delivering educational opportunities of the highest quality possible for students, consistent with the mission of the College,

Goal: Support Admissions Office and Artis College recruitment efforts to increase new student paid deposits on March 1, 2018 compared to March 1, 2017.

Status: Many efforts have been made in 2017-18 to enhance student recruitment. Examples of collaborations with the Office of Admissions include participating in all Highlander Day and Open House events as well as meeting with prospective students and their families to provide tours and specific information about opportunities in the Artis College. Other college events that recruit new students include Science Days, Science Exploration Day, the Blue Ridge Highlands Regional Science Fair, 100 Girls of Code, the RUSecure Capture the Flag competition and Summer Bridge Program. Progress has also been made to recruit transfer students including a Guaranteed Transfer Partnership Agreement signing at NVCC on August 28, 2017 as well as meetings conducted with faculty and administrators from New River Community College (NRCC) on February 12, 2018 on the Radford campus and scheduled for March 29, 2018 on the NRCC campus. College funds were also provided to the Department of Geology to host prospective transfer students on campus with tours of the science facilities and lunch in Dalton Dining Hall.

Data provided by the Office of Institutional Research reveal that efforts to increase new freshmen and transfer student paid deposits on March 1, 2018 compared to March 1, 2017 have been successful. There were a total of 2,753 ACSAT paid deposits on March 1, 2017 and 2,847 ACSAT paid deposits on March 1, 2018. This represents an increase of 3.4% in total paid deposits.

Goal: Support Admissions Office and Artis College recruitment efforts to increase diversity of new students who have paid deposits on March 1, 2018 compared to March 1, 2017.

Status: Many efforts have been made in 2017-18 to enhance new student diversity. I serve as co-chair of the Diversity and Equity Action Committee to more fully understand how the ACSAT can attract and retain a more diverse population of faculty and students.

Data provided by the Office of Institutional Research reveal that efforts to increase diversity of new students who paid deposits on March 1, 2018 compared to March 1, 2017 have been successful. There were a total of 2,753 CSAT paid deposits on March 1, 2017 and 2,847 ACSAT paid deposits on March 1, 2018, and the increase in paid deposits of female prospective ACSAT majors is 4%. The increase in paid deposits of ACSAT new freshmen and transfer students on March 1, 2018 compared to March 1, 2017 who are Hispanic is 20%, and the increase in paid deposits of ACSAT new freshmen and transfer students on March 1, 2018 compared to March 1, 2017 who are two or more races is 5%. The increase in paid deposits of ACSAT new freshmen and transfer students on March 1, 2018 compared to March 1, 2017 who are out-of-state is 5.4%.

Goal: Support the REALISE program and other partnerships to enhance new student retention from census day in fall 2017 to census day in spring 2018.

Status: A significant effort to enhance diversity and recruit prospective students through partnerships across Radford University with an emphasis in the ACSAT was the submission of a Howard Hughes Medical Institute (HHMI) Inclusive Excellence grant proposal on October 13, 2016. On June 7, 2017, the HHMI announced that Radford University was selected as one of 24 institutions to receive an Inclusive Excellence grant for \$1,000,000 over a five-year period, and I serve as Program Director for the HHMI REALISE IE grant. This HHMI REALISE IE grant project uses a making-themed curriculum, peer role modeling, postdoctoral teaching faculty and faculty learning communities in the introductory Biology, Chemistry and Physics laboratory courses as a mechanism to engage students in active learning and high impact practices in their first experience in a college science laboratory course. The Core Team members of this HHMI REALISE grant project include Dr. Tara Phelps-Durr, Dr. Jeremy Wojdak, Dr. Jeanne Mekolichick and me. I attended the HHMI Inclusive Excellence kickoff meeting with Dr. Tara Phelps-Durr on August 7-10, 2017 at HHMI headquarters in Chevy Chase, Maryland.

Another significant retention effort from faculty in the Department of Biology and the Department of Physics was the submission of a grant proposal to the Council on Undergraduate Research (CUR) for funds from an NSF IUSE grant. Dr. Tara Phelps-Durr authored the CUR Transformations Project pre-proposal that was submitted on March 1, 2017, and on July 18, 2017 CUR announced that Radford University was one of twelve institutions across the United States to be selected to participate in the CUR Transformations Project. This project proposes to retain students by embedding undergraduate research into the curricula of the Biology Department and Physics Department, and I attended the CUR Transformations kickoff meeting with Dr. Tara Phelps-Durr and Dr. Brett Taylor on October 27-29, 2017 at The College of New Jersey.

Data provided by the Office of Institutional Research reveal that efforts to increase retention of ACSAT majors from fall 2017 to spring 2018 have been successful. A cohort analysis of ACSAT new freshmen and new transfer students reveals that 84% of new freshmen were retained from fall 2017 to spring 2018 and 89% of new transfer students were retained from fall 2017 to spring 2018. Additional data reveal that 81% of ACSAT freshmen, 89% of ACSAT sophomores, 93% of ACSAT juniors and 93% of ACSAT seniors were retained from fall 2017 to spring 2018.

Goal: Support the REALISE program and other partnerships to enhance the retention of students from diverse backgrounds from census day in fall 2017 to census day in spring 2018.

Status: Data provided by the Office of Institutional Research reveal that efforts to increase retention of ACSAT majors from diverse backgrounds from fall 2017 to spring 2018 have been successful. Among ACSAT new freshmen, 80% of Asian, 87% of Black or African American students, 81% of Hispanic students and 85% of White students have been retained. Among ACSAT new transfer students, 90% of Asian, 78% of Black or African American students, 67% of Hispanic students and 94% of White students have been retained from fall 2017 to spring 2018. Among ACSAT freshmen, 78% of Black or African American students, 67% of Hispanic students and 90% of White students have been retained from census day in fall 2017 to census day in spring 2018. Among ACSAT sophomores, 100% of Asian, 86% of Black or African American students, 86% of Hispanic students and 89% of White students have been retained from census day in fall

2017 to census day in spring 2018. Among ACSAT juniors, 100% of Asian, 87% of Black or African American students, 100% of Hispanic students and 93% of White students have been retained from census day in fall 2017 to census day in spring 2018. Among ACSAT seniors, 100% of Asian, 94% of Black or African American students, 100% of Hispanic students and 92% of White students have been retained from census day in fall 2017 to census day in spring 2018.

The REALISE Core Team members also made a joint presentation entitled *Institutional Shifts Towards Inclusive Excellence in STEM* at the Advancing Diversity Workshop at Virginia Tech on January 9, 2018 at the invitation of Dr. Jill Sible, Assistant Provost for Undergraduate Education at Virginia Tech, who is one of our HHMI IE grant recipient colleagues at Virginia Tech.

Another University effort to support and retain all students is the You Matter campaign in which students are visited in the residence halls and asked general questions about their academic and residence life success for the semester. I participated in the You Matter campaign on September 14, 2017 and March 22, 2018 and met many of the Artis College majors who live in Stuart Hall.

Goal: Establish the baseline of educational opportunities that utilize inclusive excellence in fall 2017 and demonstrate an increase in educational opportunities that utilize inclusive excellence through a survey conducted in spring 2018.

Status: Implementation of the REALISE Inclusive Excellence (IE) grant has supported faculty members in Biology, Chemistry and Physics to explore the incorporation of making, project-based learning and inclusive pedagogical practices into their curriculum. During the fall 2017 semester the REALISE IE grant provided a Faculty Learning Community to two faculty members in each of the three departments of Biology, Chemistry and Physics. These six faculty members developed action plans to incorporate making and problem-based learning into their courses, and their efforts continue with a Faculty Learning Community during the spring 2018 semester. The fall 2017 semester also offered a STEMEd Reading Group for faculty to read and discuss *The Innovator's Mindset* by George Couros. Faculty were also invited to apply for kickbox grants of up to \$500 to purchase supplies needed to pilot making projects that could be embedded into the curricula, and seven kickbox grants were awarded in fall 2017. An Inclusive Excellence webinar was sponsored on September 20, 2017 as well as a PKAL webinar on October 19, 2017. A REALISE Fall Faculty Mixer was conducted on November 6, 2017 for faculty to present strategies for incorporating problem-based learning and inclusive pedagogy into their curriculum. During the spring 2018 semester, a Problem-Based Learning Workshop was conducted on January 10 and 11 by facilitators from Worcester Polytechnic Institute, and a Faculty Adoption of STEM webinar was sponsored on January 17, 2018. Faculty Learning Community members and other ACSAT faculty are participating in a STEMEd Reading Group to discuss *Learner-Centered Teaching* by Terry Doyle during the spring 2018 semester. Two kickbox grants have been awarded in spring 2018, and a REALISE Spring Faculty Mixer is planned for April 6, 2018. Surveys are being developed to assess students' perceptions of belonging in their declared majors in addition to the National Survey of Student Engagement (NSSE) and possibly the Colorado Learning Attitudes about Science Survey for majors in Biology, Chemistry and Physics that are in courses supported by the REALISE grant. These surveys and other data will be used to determine a baseline for inclusive excellence opportunities.

- to lead the College in procuring and managing fiscal, human, and physical resources necessary to accomplish these goals,

Goal: Increase the number of visits to prospective individual donors during 2017-18 by March 1, 2018 compared to the number of visits to prospective individual donors during 2016-17 by March 1, 2017.

Status: Academic year 2016-17 and fiscal year 2017 were truly historic with the \$5,000,000 gift from Dr. Pat and Mrs. Nancy Artis '73 that culminated in the naming of the Artis College of Science and Technology on April 28, 2017. The extraordinary generosity of Nancy and Pat Artis will transform the lives of ACSAT majors who benefit from the Artis Endowed Scholarship Fund as Artis Scholarship recipients. The Artis Legacy will also inspire other Radford University and Artis College alumni to support projects such as scholarships, named spaces and programmatic enhancements.

A significant advancement project of the Artis College of Science and Technology from December 1, 2015 until April 25, 2017 was the Mary Morton Parsons Foundation Challenge. Gifts from 470 individuals as well as 37 corporations, foundations and organizations contributed to the goal of raising \$700,000. On June 1, 2017, a letter from The Mary Morton Parsons Foundation informed the Office of University Advancement that our challenge had been met, and a check to Radford University was enclosed for \$350,000.

Data provided by the Office of University Advancement reveal that from July 1, 2017 until March 15, 2018 gifts-in-kind by individuals have totaled \$4,700 compared to \$2,260 in gifts-in-kind by individuals during fiscal year 2016-17 through June 30, 2017.

Visits to prospective individual donors and alumni are being planned and will be conducted in consultation with the Office of University Advancement and Office of Alumni Affairs as an advancement officer is selected with a specific assignment to the Artis College of Science and Technology. As the renovation of Reed and Curie Halls is completed in 2019-20 new opportunities for named spaces will exist, and both individual and corporate donors will be visited to solicit their support in conjunction with the efforts of the Radford University Capital Campaign.

Goal: Increase the number of visits to prospective corporate donors during 2017-18 by March 1, 2018 compared to the number of visits to prospective corporate donors during 2016-17 by March 1, 2017.

Status: In collaboration with David Horton and Tom Lillard in the Office of University Advancement, I traveled to meet with ACSAT partner Novozymes Biologicals, who has generously donated to the Summer Bridge Program since 2011, on January 25, 2018 and on campus on March 6, 2018. I also met with Dr. Jeff Pittges and corporate guests from ManTech on August 4, 2017 and with Dr. Pittges and RU alumnus Scott Crabb '95 from Knight Point Systems on November 30, 2017 and again on February 26, 2018.

I attended Roanoke Blacksburg Technology Council (RBTC) events such as the TechNite Awards on April 21, 2017 and the RBTC Fall Gala on November 2, 2017 to cultivate prospective donors for the ACSAT and the ARTIS Lab. I will also be attended the RBTC TechNite event on May 3, 2018 in Blacksburg.

Data provided by the Office of University Advancement reveal that from July 1, 2017 until March 15, 2018 corporations and foundations have made new pledges totaling \$4,150 compared to \$1,550 in new pledge balances by corporations and foundations during fiscal year 2016-17 through June 30, 2017. The Office of University Advancement also reported that from July 1, 2017 until March

15, 2018 gifts-in-kind by corporations and foundations have totaled \$243,216 compared to \$15,000 by corporations and foundations during fiscal year 2016-17 through June 30, 2017, and total giving by corporations and foundations from July 1, 2017 until March 15, 2018 amounts to \$281,941 compared to \$94,316 in total giving by corporations and foundations during fiscal year 2016-17 through June 30, 2017.

Goal: Support the efforts of faculty members to achieve a goal of 26 external grant submissions and 13 external grant awards from July 1, 2017 until March 1, 2018.

Status: From July 1, 2017 through March 13, 2018, 10 external grant proposals have been submitted by ACSAT faculty members based on information provided by the Office of Sponsored Programs and Grants Management. These 10 external grant proposals represent funding requests of \$1,968,890. Four external grants have been awarded from July 1, 2017 through March 13, 2018 that total \$286,494 in funding.

From July 1, 2016 through March 20, 2017, 13 external grant proposals were submitted by CSAT faculty members based on information provided by the Office of Sponsored Programs and Grants Management. These 13 external grant proposals represented funding requests of \$2,032,981. Nine external grants were awarded from July 1, 2016 through March 20, 2017 that represent \$582,900. From July 1, 2015 through March 21, 2016, 14 external grant proposals were submitted by CSAT faculty members based on information provided by the Office of Sponsored Programs and Grants Management. These 14 external grant proposals represent funding requests of \$2,579,167. Four external grants were awarded from July 1, 2015 through March 21, 2016 that represent \$132,843. From July 1, 2014 through March 24, 2015, 17 external grant proposals were submitted by CSAT faculty members based on information provided by the Office of Sponsored Programs and Grants Management. These 17 external grant proposals represented funding requests of \$2,880,964. Nine external grants were awarded from July 1, 2014 through March 24, 2015 that represented \$433,081. From July 1, 2013 through March 24, 2014, 17 external grant proposals have been submitted by CSAT faculty and staff based on information provided by the Office of Sponsored Programs and Grants Management. These 17 external grant submissions represent funding requests of \$3,913,708. From July 1, 2012 until March 28, 2013, there were 17 external grant proposals submitted worth \$2,378,744. Six external grants have been awarded from July 1, 2013 through March 24, 2014 that represented \$293,656 in funding. From July 1, 2013 until March 28, 2013, four external grants were awarded that represented \$107,346 in funding.

- to represent the college, its goals and needs to other external as well as internal constituencies, and

Goal: Conduct a survey of ACSAT faculty to establish an organizational communication profile baseline in the fall of 2017 and increase positive survey outcomes by March 1, 2018.

Status: David Horton created an ACSAT Communication Survey with input from the ACSAT Leadership Team, and 20 responses to the survey were received. The nine questions in the survey and their responses were:

Q1 - Most information I receive about ACSAT comes from:

Supervisor – 78.95%, Co-workers – 21.05%, with ideas for improvement including:

A bi-monthly report from the dean and another college meeting each year

Q2 - I feel like I have a voice within my department

Strongly agree - 36.84%, Agree – 26.32%, Somewhat agree – 5.26%, Neither agree nor disagree – 26.32%, Somewhat disagree – 0%, Disagree – 5.26%, Strongly disagree – 0%, with comments that included “I have an outstanding chair who always seeks collaboration on items that matter.”

Q3 – I feel like I have a voice within ACSAT

Strongly agree – 15.79%, Agree – 15.79%, Somewhat agree – 10.53%, Neither agree nor disagree – 31.58%, Somewhat disagree – 15.79%, Disagree – 10.53%, Strongly disagree – 0%, with comments that included: “Engage the faculty more in decision making. The strategic plan is a good start.” “I think the dean faces serious challenges in staying connected to the rank and file faculty. Other than a college meeting, I'm not sure I have lots of other good ideas. What about some kind of college social gathering connected to a meeting. The more we see and talk to each other, the more information moves around.”

Q4 – I feel well informed about ACSAT including programs, events, deadlines, opportunities, and responsibilities.

Strongly agree – 21.05%, Agree – 26.32%, Somewhat agree – 21.05%, Neither agree nor disagree – 15.79%, Somewhat disagree – 10.53%, Disagree – 5.26%, Strongly disagree – 0%

Q5 – I receive the information I need to perform my job in a timely manner.

Strongly agree – 5.79%, Agree – 42.11%, Somewhat agree – 15.79%, Neither agree nor disagree – 26.32%, Somewhat disagree – 0%, Disagree – 0%, Strongly disagree – 0%

Q6 – I am often delayed in my job because I do not have the information I need.

Strongly agree – 0%, Agree – 0%, Somewhat agree – 5.26%, Neither agree nor disagree – 26.32%, Somewhat disagree – 15.79%, Disagree – 21.05%, Strongly disagree – 31.58%

Q7 – I usually hear about events at the Artis College after they have happened.

Strongly agree – 5.26%, Agree – 0%, Somewhat agree – 15.79%, Neither agree nor disagree – 36.84%, Somewhat disagree – 10.53%, Disagree – 10.53%, Strongly disagree – 21.05%

Q8 – What are some barriers you have experienced in your communication within the Artis College.

“I have missed opportunities to involve my students in events organized by other departments. I have also missed the opportunity to collaborate with colleagues in other departments.”

“I will send information that should be passed onto the entire Artis College, but it is typically not shared.”

“There are a LOT of things going on and we all have to field an enormous volume of email. It's hard to sort the "wheat from the chaff". We get so many informational emails, not only from ACSAT. I miss a lot of announcements.”

“Sometimes events, grants, etc. information comes out the same day or too late. Sometimes, especially for grants, it would be great to have more notice to apply.”

“I don't know who I would speak with other than my supervisor.”

Q9 - Overall thoughts about communication within the Artis College of Science and Technology

“There could be better communication between departments.”

“Communication within the Artis College is weak. I typically hear about events after they happen. I would also like to know about fellow colleagues accomplishments. This would create a better sense of community.”

“Overall I think the Artis College does a good job of communicating.”

“I haven't given it much thought before this. I receive communications which inform me what actions I need to take.”

“The communication between departments is minimal. This is why we have departmental chairs. While collaborations are a good thing I don't need to know the day to day activities of the Math department. Probably more telling is the lack of specifics in this survey, which implies our communication folks don't know what their role is.”

Goal: Conduct a survey of ACSAT alumni to establish an organizational communication profile baseline in the fall of 2017 and increase positive survey outcomes by March 1, 2018.

Status: Artis College of Science and Technology alumni events during the 2017-18 academic year included the annual meeting of the ACSAT Advisory Council that was conducted on October 6, 2017. The annual ACSAT Advisory Council meeting included presentations of the plans for the Reed and Curie renovations as well as updates on programs across the college. Another outreach to alumni was through a video greeting that I made with the assistance of David Horton on August 11 for presentation at a meeting on Information Technology alumni who work at Eastman Chemical in Kingsport, Tennessee. I attended the Women of Radford luncheon on October 7, 2017 to meet our college's alumna and to support the keynote speaker for the luncheon, Dr. Tracy Lewis-Williams, Associate Professor of Information Technology. I also provided a presentation on Artis College achievements and opportunities to the Radford University Alumni Association National Board on January 26, 2018, and I participated in the Volunteer Summit on January 27, 2018.

I continue to work closely with the Office of University Advancement and Office of Alumni Relations to communicate with our college's alumni, and a spring solicitation letter will be mailed during the spring of 2018 along with a profile of one of our college's very successful seniors, Alex Atwood, who is a pre-medical student with double majors in Biology and Chemistry.

After our experience developing a communication survey for ACSAT, we are better informed about the best method and questions to use for developing a communication survey for ACSAT alumni. I anticipate completion and distribution of the alumni survey in consultation with the Office of University Advancement and Office of Alumni Affairs as an advancement officer is selected with a specific assignment to the Artis College of Science and Technology.

- to promote the overall excellence and welfare of the University

Goal: Participate in *The Chronicle of Higher Education* “Great Colleges to Work For” survey to establish a baseline for ACSAT faculty and staff survey responses.

Status: A careful exploration of *The Chronicle of Higher Education* “Great Colleges to Work For” survey revealed that it is designed for implementation at the institutional level instead of the unit or college level. A more appropriate survey designed for implementation at the college level is being explored, and *Standards of Practice: A Self-Assessment Guide for Academic Colleges*, is a survey instrument that has been developed by the Council of Colleges of Arts & Sciences. This self-assessment instrument is being used for reference and potentially for administration as an appropriate college survey. A survey instrument that is being administered this spring at the request of the REALISE Core Team is the Faculty Survey of Student Engagement (FSSE) that will provide complementary data for analysis of the National Survey of Student Engagement

(NSSE) being conducted this spring to measure engagement of freshmen and senior undergraduates. The FSSE survey data will likely provide useful information on faculty teaching practices and perceptions that will be helpful information to establish a baseline for ACSAT faculty survey responses.

An important project currently in progress at the department level in the ACSAT is the development of the departmental and unit versions of the Radford University 2018-2023 Strategic Plan *Embracing the Tradition and Envisioning the Future*. The departmental strategic plans will be submitted to the college by March 30, 2018 to inform the development of the Artis College version of the Radford University Strategic Plan. ACSAT Leadership Team meetings in April of 2018 are being devoted to examining all departmental strategic plans and creating the college level strategic plan. The goal for completion of the Artis College strategic plan is May 4, 2018. The department and college strategic plans will provide additional information about the goals, values and key performance indicators of the faculty and staff in the Artis College of Science and Technology.

Professional Development for 2017-18

I participated in online webinars to enhance my professional development during 2017-18 as well as the kickoff meetings for both the REALISE IE grant from HHMI and the CUR Transformations grant. I also taught BIOL 310-07 during the fall semester of 2017 as my annual contribution to the teaching mission of Radford University.