

## **Artis College of Science and Technology Annual Report for 2018-2019**

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 with 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 2018-19**

- 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 Decision 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 2018-2019

These goals are based on the roles and responsibilities of deans as described in section 4.1.3.1 on page 69 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 efforts to enhance new student and transfer student recruitment and to increase diversity of new students and transfer students

**Status:** Many efforts have been made in 2018-19 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 the Radford University Science and Technology Festival, the Blue Ridge Highlands Regional Science Fair, the RUSecure Capture the Flag competition and the Summer Bridge Program. Progress has also been made to recruit transfer students through meetings conducted with faculty and administrators from Wytheville Community College, New River Community College and Virginia Western Community College. Dr. Christine Hermann, Chair of the Department of Chemistry, has also explored a partnership with Lord Fairfax Community College to recruit transfer students to Radford University as Chemistry majors.

**Goal:** Support the REALISE program and other partnerships to enhance retention of new students, transfer students and continuing students

**Status:** The REALISE Inclusive Excellence program is in year two of five, and progress continues towards enhancing student retention. Components of the REALISE program include faculty development to support redesign of Biology, Chemistry and Physics introductory laboratory courses as well as workshops and training on inclusive pedagogy. Faculty are supported to redesign courses through reassigned time from teaching that is provided by the three postdoctoral teaching fellows who have been hired and include Dr. Ariel Firebaugh in Biology, Dr. Anna Curtis in Chemistry and Dr. Todd Rutkowski in Physics. An additional component of the REALISE program that supports student retention is the Peer Role Model program. During the spring semester of 2018, twelve peer role models representing the Biology, Chemistry and Physics Departments were hired for 2018-19, and they are being advised by Dr. Tara Phelps-Durr, Dr. Ariel Firebaugh and Dr. Matt Close. The Peer Role Models conduct drop-in consultations for students as well as social events and academic support workshops to enhance retention of students in the introductory laboratory courses. Data from the Office of Institutional Research is being collected and analyzed to assess our retention progress through the REALISE program. Other retention efforts include academic departments examining their instructional strategies in courses with high rates of D, F and W grades.

Several ACSAT faculty and I participated in the Retention Summit on January 17, 2019 as well as the Advising Conference on February 14, 2019 to support the efforts in progress to enhance retention and to learn how the Artis College can continue to contribute to these efforts. Another

University effort to support and retain 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 August 28, 2018 and March 27, 2019 where I met many of the Artis College majors who live in Stuart Hall.

**Goal:** Support the REALISE program and other partnerships to develop and enhance project-based instructional methods and learning opportunities that promote and implement inclusive excellence

**Status:** The HHMI funded REALISE IE program provides funds to faculty for exploring project-based instructional methods and learning opportunities through kickbox grants. During year one of the REALISE grant, nine kickbox grants were awarded to Dr. Amy Baliya, Dr. Joy Caughron, Dr. Jason Davis, Dr. Sarah Foltz, Dr. Rhett Herman, Dr. Sarah Kennedy, Dr. Sara O'Brien and Dr. Rhett Herman, Dr. Sarah Redmond and Dr. Laura Gruss. The investments of funds and faculty efforts in these kickbox grants have already been returned with presentations made by faculty during the spring 2018 REALISE Faculty Mixer as well as with a publication by Dr. Joy Caughron that resulted from her kickbox grant project. As the REALISE IE program evolves, new opportunities arise, such as the Collaborative Course Redesign proposals that have been provided to faculty in spring 2019. Funds were also provided from the Artis College budget and the Office of Academic Programs to support a three-day workshop in the Department of Chemistry to redesign the curriculum in Chemistry 111 during the summer of 2018. This very successful curriculum redesign workshop was led by Dr. Sarah Kennedy, Assistant Professor of Chemistry, and member of the REALISE Core Leadership Team. Significant efforts are also being made to provide faculty development in inclusive pedagogy to faculty learning community cohort members and other interested faculty members. These efforts include workshops on group work, team building and microaggressions as well as the STEM Ed reading group that discusses relevant books such as *Breakthrough Strategies* by Kathleen Ross during the fall 2018 semester and *Teach Students How to Learn* by Saundra Yancy McGuire that is currently being read in the spring 2019 semester. A new resource that is now available to enhance our understanding of inclusive pedagogy is the addition of Dr. Sharon Jones to the REALISE IE Core Leadership Team. Dr. Jones has extensive professional experience in promoting inclusive practices, and we look forward to her contributions to the efforts of REALISE to enhance a culture of inclusive excellence.

**Goal:** Support efforts to achieve the University, college and departmental goals in the Radford University 2018-2023 Strategic Plan *Embracing the Tradition and Envisioning the Future*

**Status:** The faculty and staff of the Artis College are making significant contributions to achieving the goals of the Radford University 2018-2023 Strategic Plan *Embracing the Tradition and Envisioning the Future*. In a report submitted on September 28, 2018, the following goals were supported through the work of the Artis College.

Academic Excellence and Research Goal 1

- REALISE IE program is providing training and reassigned time for faculty to develop problem-based learning opportunities in introductory science lab courses.
- REALISE IE program has provided kickbox grant funds for faculty to develop inclusive pedagogy and problem-based learning instructional strategies for introductory science lab courses.

- Faculty from the Artis College developed curriculum for the Cybersecurity certificate that is provided as competency-based education by the Chachra IMPACT Lab.
- Faculty from the Artis College developed curriculum for the Geointelligence certificate that is provided as competency-based education by the Chachra IMPACT Lab

#### Academic Excellence and Research Goal 3

- The B.S. in Cybersecurity degree was approved by SCHEV effective November 16, 2018 to initiate effective spring 2019.
- The Cyber Defense Club is a student organization that trains with a faculty coach and competes at cybersecurity events such as CyberSEED, the Cyber Fusion Conference and Virginia Cyber Cup Competition and the Mid-Atlantic Regional Cyber Defense Competition
- Dr. Art Carter, Chair of the Department of Information Technology, developed curriculum pathway documents for students at NVCC, VWCC and NRCC to transfer to Radford University and pursue degrees in Computer Science and Information Science and Systems.
- Dr. Chester (Skip) Watts and faculty members of the Department of Geology conduct research in engineering geology and rock slope stability for the Virginia Department of Transportation as well as private companies through the Geohazards and Unmanned Systems Research Center.
- ITEC 145 Data Ethics, Privacy and Security is an online course designed for non-majors with limited background in Information Technology that fosters ethical behavior and introduces students to privacy and security issues of their personal data on mobile devices and social media

#### Academic Excellence and Research Goal 4

- REALISE IE program is providing training and reassigned time for faculty to develop problem-based learning opportunities in introductory science lab courses.
- REALISE IE program has provided kickbox grant funds for faculty to develop inclusive pedagogy and problem-based learning instructional strategies for introductory science lab courses.

#### Strategic Enrollment Growth Goal 8

- REALISE IE program is providing training and reassigned time for faculty to develop problem-based learning opportunities in introductory science lab courses.
- REALISE IE program has provided kickbox grant funds for faculty to develop inclusive pedagogy and problem-based learning instructional strategies for introductory science lab courses.

#### Student Success Goal 1

- REALISE IE program is providing training and reassigned time for faculty to develop problem-based learning opportunities in introductory science lab courses.

The departments of the Artis College completed their strategic plans by April of 2018, and those plans have been compiled into a master spreadsheet from which a draft of the Artis College Strategic Plan has been developed. The work of editing and revision the draft version of the Artis College Strategic Plan continues with a goal of a version to submit to the Artis College faculty for final review and approval in August of 2019.

**Goal:** Support the efforts to achieve the merger of the Jefferson College of Health Sciences with Radford University

**Status:** As a member of the Academic Programs and Accreditation Subcommittee, I attend the weekly committee meetings to contribute to the Jefferson College of Health Sciences (JCHS) merger process discussion, and I work closely with the departments in the Artis College that are affected by the merger most directly. Dr. Justin Anderson, Chair of the Department of Biology, has worked diligently with his faculty as well as with Dr. Robin Davies and Professor Laura Link at the JCHS to coordinate the planning of the B.S. in Biomedical Sciences and the B.S. in Medical Laboratory Science degree programs that will become curriculum in the Biology Department after the merger. Dr. Anderson has also reviewed the credentials of JCHS biologists who will join the Radford University Biology Department as faculty. Dr. Christine Hermann, Chair of the Department of Chemistry, has worked closely with Dr. Robin Davies to evaluate the Chemistry Program curriculum at JCHS, and she has reviewed the credentials of the chemist at JCHS who will join the Radford University Chemistry Department. Dr. Neil Sigmon has met and reviewed the credentials of the statistician at JCHS who will join the Radford University Department of Mathematics and Statistics as a faculty member after the merger, and that faculty member is employed as an adjunct faculty member to teach STAT 200 this spring here at Radford University. Dr. Donna Boyd has met with Dr. Diana Willeman-Buckelew to discuss the curriculum and opportunities for growth in the Forensic Science program. We have hosted tours of the Center for the Sciences facilities for Dr. Frank Dane, Dr. Robin Davies, Professor Laura Link, Professor Krystina Angelini and Dr. Willeman-Buckelew. Dr. Anderson, Dr. John Kell, Dr. Matt Close, Dr. Hermann and Dr. Sigmon have toured the facilities at the JCHS.

**Goal:** Explore how faculty and student research and engagement in high impact pedagogical practices can be supported and work with departments to enhance faculty research productivity

**Status:** In March of 2018, President Hemphill provided the final report of the Research Productivity Work Group to the campus community. I co-chaired this Work Group with Associate Vice President for Finance and University Controller Stephanie Jennelle. The members of the Work Group included Dr. Adrian Aron, Ms. Lisa Blackwell, Dr. Brooke Blanks, Mr. John Brooks, Dr. Tom Duncan, Dr. Sarah Hastings, Dr. Laura Jacobsen, Dr. Sara O'Brien, Ms. Laura Quesenberry, Dr. Patricia Winter and Dr. Joe Wirgau. The Research Productivity Work Group Final Report has informed the Artis College Strategic Plan in several ways so that faculty and student research can be supported. Specific draft goals in the Artis College Strategic Plan that support faculty and student collaborative research and engagement in high impact pedagogical practices include the following.

Academic Excellence and Research Goal 1.A.3. Encourage faculty to engage in professional development for enhancing teaching effectiveness and promoting inclusive pedagogical practices as well as high impact practices such as undergraduate research and study-abroad opportunities.

Academic Excellence and Research Goal 4.C. Establish department policies for contact hours or credit hours of teaching for T&R tenure-track and tenured faculty who supervise student research and/or develop innovative and inclusive instructional pedagogy.

Academic Excellence and Research Goal 4.D. Encourage faculty to create summer research opportunities to mentor students and to seek summer funding through the OURS program and/or internal/external grants. Advocate for a funding mechanism that will permit funding across fiscal years during summer.

Academic Excellence and Research Goal 4.F. Continue to provide faculty development opportunities in project-based learning and inclusive pedagogy to all faculty members and partner with other resources to support faculty in providing students engaging learning experiences.

Student Success Goal 1.A. Support departmental efforts to embed high impact practice experiences in the curriculum to provide all majors opportunities to experience at least one during their course of study and increase the number of students engaged with research, scholarship and creative activities within and beyond the classroom.

Student Success Goal 1.A.1. Successfully implement curricular revisions to embed research and project-based learning in courses in coordination with REALISE and CUR Transformations grants. Encourage faculty to become more involved in undergraduate research by providing reassigned time for this work and recognition on annual faculty evaluations.

On December 25, 2018, I was appointed to the position of Interim Dean of the College of Graduate Studies and Research as well as Interim Institutional Official. I will fulfill these roles until June 30, 2019 when Dr. Ben Caldwell will begin as Dean of the College of Graduate Studies and Research. These roles have provided me new perspectives and insights into the human subjects and vertebrate animal research conducted by faculty and students as well as opportunities to support their efforts and research productivity.

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

**Goal:** Pursue new relationships with corporate partners and continue to pursue gifts to the ACSAT

**Status:** In August of 2018 the Artis College of Science and Technology was provided a Major Gifts Officer dedicated to our college and advancement efforts. We are very fortunate to be working with Ms. Vanessa Quesenberry in this critical role. Vanessa has an extraordinary work ethic and valuable experience with the Office of Alumni Affairs. She has already established a new partnership with Dr. Richard Obiso and Dr. Theresa Gallagher at Whitebarrel Winery as well as established a gift agreement for the Geohazards and Unmanned Systems Research Center. Vanessa has also submitted funding proposals for the Summer Bridge Program and talked to prospective donors about establishing scholarships. She has implemented two endowed scholarships and a study abroad award in the Artis College.

On January 30 through February 1, 2019 Vanessa and I attending the Council for Advancement and Support of Education (CASE) conference in Fort Myers, Florida where we attended many workshops and plenary sessions for deans and their advancement officers. Vanessa and I collaborated on the Giving Tuesday campaign that resulted in additional gifts to our college and programs. I will also be participating in the Highlander Family Tour to Raleigh, North Carolina, Dunwoody, Georgia and Charlotte, North Carolina with Vanessa to further explore prospective partnerships and donations to the Artis College.

I attend Roanoke Blacksburg Technology Council (RBTC) events such as the TechNite Awards on May 3, 2018 to cultivate prospective donors for the ACSAT and the ARTIS Lab. I will also be attending the RBTC TechNite event on May 3, 2019 in Roanoke.

**Goal:** Support the efforts to achieve the University and college goals in the Capital Campaign

**Status:** I met with the University Advancement senior leadership team and Vanessa on March 5, 2019 to begin the discussions on the Artis College participation in the Capital Campaign. Vanessa and I have been working on drafts of campaign materials, and we have discussed strategies for visits to prospective partners. I have made the Artis College Leadership Team aware of the silent phase of the Capital Campaign, and I am soliciting their advice and input as we seek donors and new partners during the Capital Campaign. On April 5, 2019, I will be making a presentation to the Capital Campaign Committee on behalf of the Artis College. As the renovation of Reed and Curie Halls is completed in December of 2019 new opportunities for named spaces will exist, and both individual and corporate donors will be visited to solicit their support.

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

**Goal:** Communicate through the ACSAT newsletter and alumni newsletter, ACSAT website, ACSAT Facebook page and by meeting with students, faculty, staff, alumni and donors

**Status:** The ACSAT newsletter *From the Dean's Desk* that is written and designed by David Horton continues to be successful in communicating news to ACSAT faculty, staff and friends. David makes every effort to include news from all departments of the ACSAT. David has tremendously enhanced the ACSAT Facebook page and website with frequent updates that feature articles, videos, photographs and links to ACSAT faculty and students activities. David has also devoted a significant amount of his time developing a YouTube channel and a Twitch channel for the Artis College to use for live streaming of our RUSecure Capture the Flag competition on April 27, 2019.

David also coordinated the first annual Radford University Science and Technology Festival that was extremely successful last year on April 14, 2018. This event involved our own ACSAT faculty and students as well as guests from Novozymes Biologicals, the Science Museum of Western Virginia, Mill Mountain Zoo, Virginia Tech and the Radford City Public Schools "Robocats" robotics team.

During 2018-19 I met with the ACSAT departments to introduce Vanessa as our Major Gifts Officer and to ask for assistance from faculty members for identifying prospective donors and corporate partners. I also meet with faculty at their request, and I conduct an open door policy for listening to faculty input and for hearing faculty concerns.

**Goal:** Support efforts to engage alumni in the work of the ACSAT

**Status:** Artis College of Science and Technology alumni events during the 2018-19 academic year included the annual meeting of the ACSAT Advisory Council that was conducted on October 19, 2018. The annual ACSAT Advisory Council meeting included presentations of the REALISE Inclusive Excellence program and the potential it has to transform teaching and learning in the Artis College. We also toured Reed and Curie Halls to view the progress of the renovation and to consider potential donors for named spaces in our new facilities. I attended the Women of Radford luncheon on October 20, 2018 to support our college's alumnae, and I made a presentation on Artis

College achievements and opportunities at the Volunteer Summit on February 23, 2019.

I continue to work closely with Vanessa and the Office of Alumni Relations to communicate with our college's alumni, and a Spring Fever solicitation letter will be mailed during the spring of 2019 with a profile of a very successful alumnus of the Artis College.

I will also be participating in the Highlander Family Tour to Raleigh, North Carolina, Dunwoody, Georgia and Charlotte, North Carolina with Vanessa to further explore prospective partnerships and donations to the Artis College.

**- to promote the overall excellence and welfare of the University**

**Goal:** Support positive morale among faculty and staff across the ACSAT by listening to faculty concerns and soliciting faculty input in decisions affecting the ACSAT

**Status:** I frequently met with ACSAT faculty to discuss issues ranging from individuals with specific requests to concerns from departments during 2018-19. The meeting agendas included requests for resources, concerns raised by students and parents, performance evaluation and building renovation issues. I also write many letters of support for faculty members to assist in their applications for grant proposals and nominations for awards.

I consult the ACSAT Leadership Team frequently to discuss issues affecting the ACSAT faculty, staff and students, and I highly value and respect the input of the ACSAT Leadership Team in arriving at decisions through collaborative leadership and shared governance.

**Goal:** Support efforts to enhance the academic reputation of the ACSAT and Radford University

**Status:** The academic reputations of the ACSAT and Radford University are enhanced by the achievements of the faculty and students of the ACSAT. I am privileged to represent the ACSAT and to share the achievements of the faculty, staff and students. I participated in the Radford University MLK Day of Service on January 21, 2019 at the Boys Club and Girls Club in Roanoke, Virginia. I was extremely honored to join Dr. Agida Manizade and her family for the SCHEV Outstanding Faculty Award ceremony in Richmond on March 7, 2019 where Dr. Manizade was honored as the most recent recipient of the SCHEV Outstanding Faculty Award at Radford University.

The academic reputation of the ACSAT is enhanced every time the ACSAT faculty and students accomplish our teaching, research and service missions. Teaching successes include inclusive pedagogical innovations and assessment strategies that enhance our teaching effectiveness. Research successes include faculty members who mentor student research and supervise their research presentations at national conferences and meetings. Service and outreach successes include all the science, technology and mathematics education and outreach events that are possible through the work of the ACSAT faculty and staff. Another successful outreach and recruiting event for prospective students this spring was the Blue Ridge Highlands Regional Science Fair on March 8 and 9 that is co-directed by Dr. Christine Hermann and Dr. Kimberly Lane in the Department of Chemistry. Many ACSAT faculty members are planning presentations for the Radford University Science and Technology Festival outreach event on Saturday, April 6, 2019.



The academic reputation of the ACSAT is also promoted to prospective students in grades 1-6 through Camp Invention that was conducted last summer during June 18-22, 2018. Summer Bridge Program enhances the academic reputation of the ACSAT for high school girls. Summer Bridge Program was conducted from July 15-20, 2018, and the ACSAT faculty members who taught courses in Summer Bridge Program were Dr. Rhett Herman and Ms. Brenda Hastings, Dr. Beth McClellan and Mr. George Stephenson, Dr. Kimberly Lane and Dr. Sarah Kennedy, Dr. Hwajung Lee, Dr. Cliff Boyd and Dr. Donna Boyd. The academic reputation of the Artis College and Radford University will be enhanced by the RUSecure Capture the Flag competition that is co-directed by Dr. Joe Chase and Dr. Prem Uppuluri in the Department of Information Technology. The RUSecure Capture the Flag competition is a departmental outreach and recruiting effort for high school and community college students that has been conducted since 2017. The participants registered for the preliminary round of the 2018-19 competition include approximately 330 teams and more than 1,500 students. This extraordinary outreach event will be promoted through an online streaming service called Twitch. Twitch is currently the fourth most popular streaming service and has focused primarily on streaming video gaming. Due to Twitch's streaming content, it has a very high percentage of teenage viewers who are a high value target for our promotional efforts. The final round of the RUSecure Capture the Flag competition is scheduled for April 27, 2019 on the Radford University campus.

#### **Professional Development for 2018-19**

I participated in online webinars to enhance my professional development during 2018-19 as well as the annual Program Director meeting for the REALISE IE grant from HHMI. I also taught BIOL 310-07 during the fall semester of 2018 as my annual contribution to the teaching mission of Radford University.