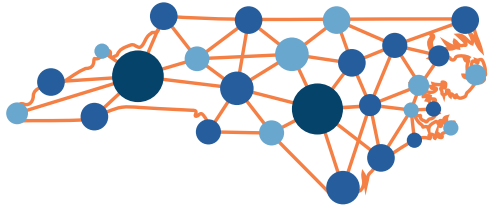




Annual Report 2022



CAROLINA CYBER NETWORK

Developing Talent
Protecting Our Future

Content

Member Schools and Advisors	3
Sector and Working Groups	4
Message from Leadership	5
Program Highlights	6-9
Student Success Profiles	10
Looking Forward	11-13
Budget Allocations	14
Measuring Performance - KPIs	15

MISSION

Strengthening North Carolina's cybersecurity capabilities through a coordinated, work-ready talent development system connecting employers with needed talent.

VISION

Create and deliver a first-of-its kind national demonstration project enabling a high-performance, holistic cybersecurity workforce pipeline for public and private entities.

PRINCIPLES

The Carolina Cyber Network seeks to achieve two principal outcomes. First, to nurture the full-life cycle of North Carolina cybersecurity practitioners, from identification to self-selection and lifelong learning. Second, to serve the business and institutional communities of North Carolina by contributing to their cybersecurity success.



Member Schools and Advisory Board

Blue Ridge Community College

Scott Queen

Vice President of Economic and Workforce Development

Caldwell Community College and Technical Institute

Keegan Anderson

Dean, Career and Technical Education

Catawba Valley Community College

Ricky Barnes

Director of Information Technology Education

Elizabeth City State University

Kuldeep Rawat

Dean of School of Science, Aviation, Health and Technology

Fayetteville Technical Community College

Clifton Oxendine

System and Security Analysis Instructor

Forsyth Technical Community College

Tony Brown

Department Chair, Davis ITEC Cybersecurity Center

Gaston College

Mark Shellman

Department Chair of Information Technology

Montreat College

Kelli Burgin

Department Chair of Cybersecurity

North Carolina A&T State University

Salil Desai

Director of the Center of Excellence in Product Design
and Advanced Manufacturing

Piedmont Community College

Melissa Robbins

Dean, Business Studies and Emerging Technologies

Richmond Community College

Lance Barber

Information Technology Program Coordinator

Stanly Community College

Gonda Watson

IT Cybersecurity Program Head

Wake Technical Community College

Carolyn DeSimone

Associate Professor/Program Director, Cybersecurity

Wayne Community College

Tracy Schmeltzer

Dean of Business and Computer Technologies

Sector and Working Groups

The CCN is committed to engaging industry leaders through Sector Groups to ensure our students meet workforce needs across the state. Each group enlists an advisory board of corporate partners who provide valuable, timely, and specific insights for how to prepare CCN cyber students to be work-ready on day-one. We also collaborate through Working Groups on specific projects addressing challenges across the network.

Working Groups

EDUCATIONAL TECHNOLOGIES

This group is focused on identifying appropriate educational technologies, such as cyber ranges, and facilitating access to those technologies for all member schools. At this time, CCN member schools have access to two cyber ranges at no cost. These ranges provide simulated real-world exercises to reinforce learning and improve retention.

CURRICULUM ALIGNMENT

To support our CAE designations and Articulation agreements, CCN is actively working to ensure cyber curricula of member institutions are aligned to the NICE/NIST standards and to employer workforce needs.

K-12 CYBER EDUCATION

Building a robust pipeline to post-secondary education starting with skill building and career exposure in elementary, middle, and high school. CCN schools are working collaboratively to share resources and strategies that excite the next generation of cyber talent across NC K-12 schools.

PROFESSIONAL AND ESSENTIAL LIFE SKILLS

We are working to provide a Professional and Essential Life Skills curriculum that enriches the cyber education in CCN schools. Career success in cyber is dependent not only on technical knowledge and skill, but also on professional skills such as collaboration, critical thinking, and communication.

Current Sector Groups

AGRICULTURE

Scott Queen

Blue Ridge Community College

BIOTECHNOLOGY

Keegan Anderson

Caldwell Community College and Technical Institute

CRITICAL INFRASTRUCTURE

Kuldeep Rawat

Elizabeth City State University

FINANCIAL SERVICES

Larry Young

Montreat College

HEALTHCARE

Robin Ross

Catawba Valley Community College

MANUFACTURING

Salil Desa

North Carolina A&T State University

MILITARY TRANSITION

Tennette Prevatte

Fayetteville Technical Community College

Message from the Executive Directors

It has been another extremely productive year for the Carolina Cyber Network. We invite you to read through this annual report to understand what we accomplished this past year and gain insight into our aggressive plans for 2023. The Network was established in late 2020 through a partnership between Montreat College and Fayetteville Technical Community College, with support by a grant from the North Carolina Department of Information technology (NCDIT). Starting with 11 member schools, which included 2-year community colleges, and 4-year institutions, we added three more schools in 2022 and are in the process of adding additional members this year. As a result, the total number of students impacted has risen from 802 with the initial 11 CCN members to 2,134 with the current 14 CCN members. You can read about the details of this accomplishment in this report.

It is important to note that the impressive cooperation between member schools played a significant part in our early success. It was a bold concept to try and align goals, raise standards, and provide mutual support to institutions that may have considered themselves competitors. However, the members understood that by working together we could



DR. MARK SORRELLS
President,
Fayetteville Technical
Community College



LARRY YOUNG
Executive Director,
Carolina Cyber Center
of Montreat College



DAVID THOMPSON
President and CEO
RBX Solutions

raise the quality of education, solve shared problems, eliminate barriers, and increase the quality and quantity of work-ready cyber professionals of character for North Carolina.

This project has been so successful that we are getting inquiries from other states to help them build cyber networks modeled after CCN. We also see our efforts being emulated by other institutions in our own state; imitation is the sincerest form of flattery!

Program Highlights

2022 Convenings

CCN members meet twice each year to hear from cybersecurity experts, share accomplishments, discuss on-going challenges, and connect with CCN sector and working groups. In April, members met at Fayetteville Technical Community College and heard from Rob Main, NC Chief Information Risk Officer, on the importance of a cybersecurity workforce development program with and for state and local government agencies. Marie Baker, Technical Manager the Cyber Skills Academy program for DHS/CISA, discussed the cyber education program and provided information on a wide spectrum of free cyber training/education resources suitable for community college programs. In September, the convening was held at Catawba Valley Community College in Hickory. This event had the most representation by government officials, industry partners, and members of all convenings to date. Members heard again from Rob Main and from Lynne Clark, Chief of the National Security Agency's Center for Cybersecurity Education, Innovation, and Outreach. In addition, representatives from Cyberbit, Cellcrypt, and Center for Regional Economic Competitiveness presented new products and services. CCN Service Awards were presented to NC State Senator Ralph Hise and Representative Jason Saine for their support of cyber education and preparedness in the state.

Strength and Weakness Assessment Completed

The Center for Regional Economic Competitiveness (CREC) has provided an initial assessment of talent demand and insights to CCN regarding how to expand and improve the cybersecurity talent pipeline through engagement and alignment with industry demand. The project seeks to supplement industry demand data with an assessment of CCN strengths and weaknesses as well as of opportunities for CCN to expand and respond to market demands more nimbly.



Training for K-12 Educators

Fayetteville Technical Community College will partner with the Friday Institute to host a regional computer science training for middle and high school teachers through Code.org. The program is funded by NCDPI to increase the number of teachers across the state who are prepared to teach middle and high school computer science courses.

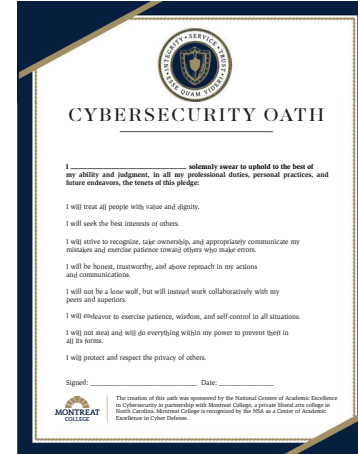


Montreat College Holds 8th Annual Cybersecurity Retr3at

This annual event has been a mainstay for the college since the inception of its Cybersecurity department. Starting with a local business leaders' luncheon held at The Venue in downtown Asheville, a full house enjoyed a catered lunch and a presentation by Ed Skoudus of the SANS Institute. The following two days of meetings were held on the Montreat Campus, where the program was customized for business leaders, cyber technical professionals, and cyber instructors. In addition, the college ran events for high schoolers and potential cyber students.

Cybersecurity Oath Unveiled at CCN Fall convening

This past fall at the CVCC convening, a new Cybersecurity Oath was unveiled for all members to take back to their institutions and incorporate into their training curricula. The Oath was developed as part of a NSA grant funded book on cybersecurity ethics written by Dr. Paul, president of Montreat College, and Ed Skoudis, president of the SANS Institute. A digital copy of the Cybersecurity Oath is free to download at montreat.edu/cyber-oath.



Forsyth Technical Community College Recognized with Prestigious Award by EC-Council

Forsyth Technical Community College received a 2022 Academic Circle of Excellence award from EC-Council, one of only five issued each year. The Circle of Excellence awards highlight the highest levels of cybersecurity education, training, executive leadership, and instruction among EC-Council's partner academic institutions, academic faculty, commercial training centers, corporate organizations, CISO's, and Certified EC-Council Instructors (CEI's) globally.



CCN Provides Practical Supports to Member Schools

The CCN works to provide assistance and support in areas that are cost-prohibitive to individual schools. Fayetteville Technical Community College, offers access to its on premise NDG Netlab environment to all CCN member schools. In addition to FTCC, Stanly and Wayne also make access available to their Netlabs. The Netlab delivers labs remotely in the following areas:

Cisco CCNA, Cisco Cyberops, OpenShift, Palo Alto Firewalls, Redhat Linux Administration, Redhat Ansible, and Security+. All member schools also have access to cyber ranges, at no cost, that provide students with simulated real-world experiences. The ranges have been very effective at providing “hands-on” experiences that employers demand. In addition, the CCN helps connect schools to potential industry partners and serves as a clearinghouse for information gleaned from national cyber conferences and government sources.

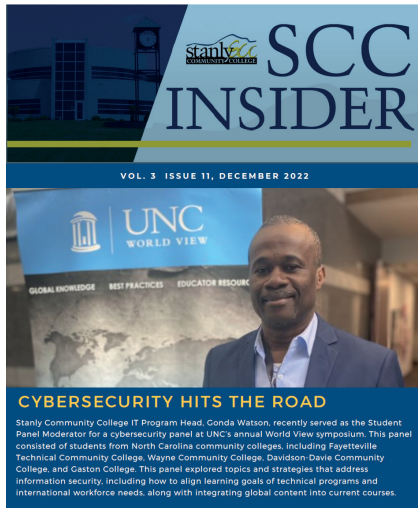


Montreat Ties In First International Cyber League Collegiate Cup

In a fierce final competition with 20 teams worldwide, Montreat College tied for first place with Purdue University in Cyberbit's International Cyber League (ICL) Collegiate Cup. The competition was the first of its kind, taking place in virtual, cloud-based cyber ranges as students tested their real-world skills. Finalists had three hours to match their strength against a live-fire cybersecurity attack in a virtual security operations center. Before getting to the finals, however, each team member had to complete an individual challenge determining the top twenty collegiate teams. Montreat competed against notable teams: the National Cybersecurity Champions University of Central Florida (a longtime cybersecurity champion), Embry Riddle, LSU, and the Coast Guard Academy, among others. The team's consistent use of Cyberbit labs and live-fire exercises before competing may have played a role leading to their success. Each student demonstrated their readiness for real-world scenarios, rising to the challenge of being both professionals of character and technically skilled.

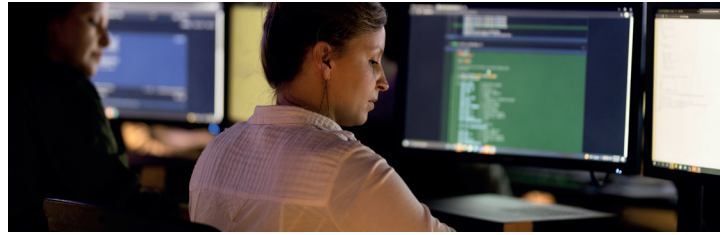
Students at Fayetteville Technical Community College Tackle NSA Codebreaker Challenge

Fayetteville Technical Community College finished 65th out of 445 entries in the NSA Codebreaker Challenge. The Challenge provided students an opportunity to work on a realistic problem-set centered around NSA's mission to protect the U.S. Government's national security information systems. Students used reverse-engineering and low-level code analysis skills to complete a series of tasks worth varying amount of points based on their difficulty.



Stanly Community College Leads During UNC at Chapel Hill's Annual Symposium

Gonda Watson, IT Program Head from Stanly Community College, served as the Student Panel Moderator for a cybersecurity panel at University of North Carolina Chapel Hill's annual World View symposium. The panel consisted of students from three CCN member schools, Fayetteville Technical Community College, Wayne Community College, and Gaston Community College, as well as students from Davidson-Davie Community College. Discussion topics included how to align learning goals of technical programs to international workforce needs and integrating global content into current courses.



Security Operations Center (SOC) opened by the Carolina Cyber Center (C3)

Through a grant from NCDIT to Montreat College, the C3 established a security operations center to provide assessments, MSSP services, and consulting to small and medium-sized businesses in North Carolina. Resources from CCN are being used in the SOC which provide 16,000 hours of paid work-based learning and real-world work experience to soon-to-be graduates of CCN member schools. This opportunity gives them the "last mile" in developing practical skills, ensuring these new cyber professionals are even more prepared for their first employment opportunity. In addition, the SOC offers low-cost assessments and MSSP services to aid building a network of corporate partners seeking new avenues to recruit skilled talent.

Support for CAE Accreditation Provided by RBX Solutions

RBX Solutions is working with member schools to obtain or renew CAE (Center of Academic Excellence) accreditation from the NSA (National Security Agency). RBX assists schools in completing the application pre-requisites including a GAP analysis, the application checklist, and submission of the Program of Study. Once the schools have completed the pre-requisites, RBX helps each school outline their path to accreditation and identifies areas that need additional work and provides guidance for completion of a successful application. In 2022, Gaston College received CAE designation. Stanly, Richmond and Wayne community colleges are on track to submit their applications in early 2023.

STUDENT SUCCESS PROFILES

Piedmont Community College

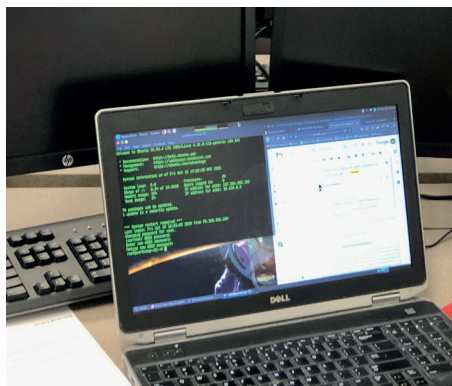
Michael began his cyber security journey after being laid off from his job during the pandemic. He had worked in supply chain/logistics for over twenty years. He decided to go back to school to finish his degree and chose Information Technology online with Piedmont Community College. While at PCC, he earned an Associate in Applied Science degree in Information Technology Business Support, as well as an IT Data Base Support Certificate and Google certifications in cyber security, system administration, tech support, network support, and superuser support. In addition, he attended preparation classes for the CompTIA Network+ and Security+ certifications and is on track to take those exams in early 2023.



Michael currently works for a local medical school as a tech support technician dealing with issues ranging from software installs to malware and browser hijackers. He credits classes at PCC for preparing him to manage confidential and sensitive information in a highly regulated industry. Michael said that PCC helped him start a new career in security and tech support, and “I invite anyone with the time and drive to pursue a career in cybersecurity.”

Fayetteville Technical Community College

Sheena became interested in cybersecurity after hackers drained her daughter’s bank account. Looking to protect her family, she went to Fayetteville Technical Community College searching for a class to teach her how to stop hackers. FTCC faculty explained that she was not likely to find the hacker, but through FTCC’s Systems Security & Analysis program, she could gain the tools to make it difficult for hackers to breach her home network.



“In my past, I was told that I couldn’t do something because I was a girl. My classes at FTCC were full of men, but no one disrespected me because I was female. That was very important.” In the future, she hopes to start a mentorship program to encourage and support women in cyber. “It’s hard when you don’t see yourself represented.”

While at FTCC, Sheena joined the Cyber Security Club and was a member of Phi Theta Kappa and the National Technical Honor Society. She received multiple scholarships and worked part-time in the FTCC data labeling lab.

After completing her degree at FTCC, she transferred to

Montreat College to complete a Bachelor of Science Degree in Cybersecurity and is currently working in the Carolina Cyber Center of Montreat College, Security Operations Center (SOC). In 2022, she received a prestigious U.S. Department of Defense Cyber Scholarship that includes a paid internship with a DoD organization. Her advice to other students; “participate in everything, volunteer, just do it.”

Looking Ahead

Projects coming in 2023

The CCN has four new projects ready to launch in 2023.

Seminar in a Box

CCN will provide member schools the resources they need to host community outreach activities such as lunch-and-learns and shredding events.

Train-the-Trainer

This training is designed to provide current K-12 teachers or college instructors with the

knowledge and skill to teach introductory cyber courses and for cyber professionals to learn to teach at the K-12 and/or the college level. The program aims to increase the number of qualified cyber instructors for member schools and their K-12 partners.

Job Placement Service

Job preparation and placement is a service that will coach recent

grads through their job search and utilize a growing network of employers to help CCN graduates land their first cyber position.

Curriculum Alignment

CCN members will work together to align cybersecurity courses to NIST/NICE standards and employer workforce needs.



Looking Ahead

Subgrants Awarded

The CCN awarded subgrants to eight of its member schools. The schools are using these grants to expand programming, develop short-term training opportunities, hire staff and faculty, develop K-12 partnerships, build or enhance labs, and provide scholarships and certification vouchers to students.

Blue Ridge Community College

BRCC will use this grant to expand the Fiber Optic Cable Installation curricula into an apprenticeship pathway, upgrade two of its lab spaces with more advanced equipment (better processing power for virtualization software) to deliver security classes, market cyber career opportunities to young adults and potential career changers, and provide financial support to students for tuition, fees, supplies, and certification exams.

Catawba Valley Community College

This project will add two new cybersecurity positions at CVCC: Director of the Cybersecurity Center of Excellence and full-time

cyber faculty position. The added leadership and faculty positions will allow CVCC to meet identified needs by aligning curriculum to essential cyber knowledge, skills and abilities, and focus on continuous improvement necessary to obtain and maintain the CAE designation. In addition, these positions will support the development of short-term training courses for individuals currently employed in the cybersecurity industry.

Forsyth Technical Community College

Forsyth Technical Community College will use grant funds to help students, K-12 teachers, and the community. Project activities include: 1) administering BreakoutEDU workshops, where teachers use the Breakout kits and digital

subscriptions to teach students cybersecurity principles; 2) hiring a teaching assistant to support first year students in the cybersecurity program; 3) adding 4 Palo Alto Firewalls to 4 networking pods in the security room; 4) incorporating a Cellebrite UFED Touch 2 device into the Data Recovery course; 5) provide certification exam vouchers to students; 6) assist other network schools in providing exam vouchers to their students; and 7) offering free shredding services to the community during Cybersecurity Awareness Month.

Gaston College

Gaston College will expand networking and cyber defense labs to all three of its campuses. Additionally, the College will expand course offerings through the development of a general one-credit hour introductory

cybersecurity course and an equivalent non-credit course to introduce students to cybersecurity and prepare them for the cybersecurity degree program. To ensure these efforts are designed to meet the needs of employers, Gaston College will create an advisory board and conduct a needs assessment of business and industry.

Piedmont Community College

This grant will support the Pacer CyberSecurity Academy (PCA), a gateway for students to gain access to state-of-the-art training in the field of cybersecurity. Using the NICE framework as a guide, PCC will build an advanced lab allowing students opportunities to work with various types of operating systems, equipment, and environments. Courses and curriculum will be designed to provide students with

a deep understanding of planning/designing, building, and maintaining systems. The PCA will also partner with state and local industry to better understand their needs and the training required to build proactive security teams.

Richmond Community College

RichmondCC will develop a SCADA (Supervisory Control and Data Acquisition) course to prepare students in the Electrical Substation and Relay Technology program to defend against industrial cybersecurity threats. The College will also develop a short-term training course for students seeking entry or advancement in cybersecurity roles. This course will prepare students for certification exams for CompTIA Network+ and CompTIA Security+.

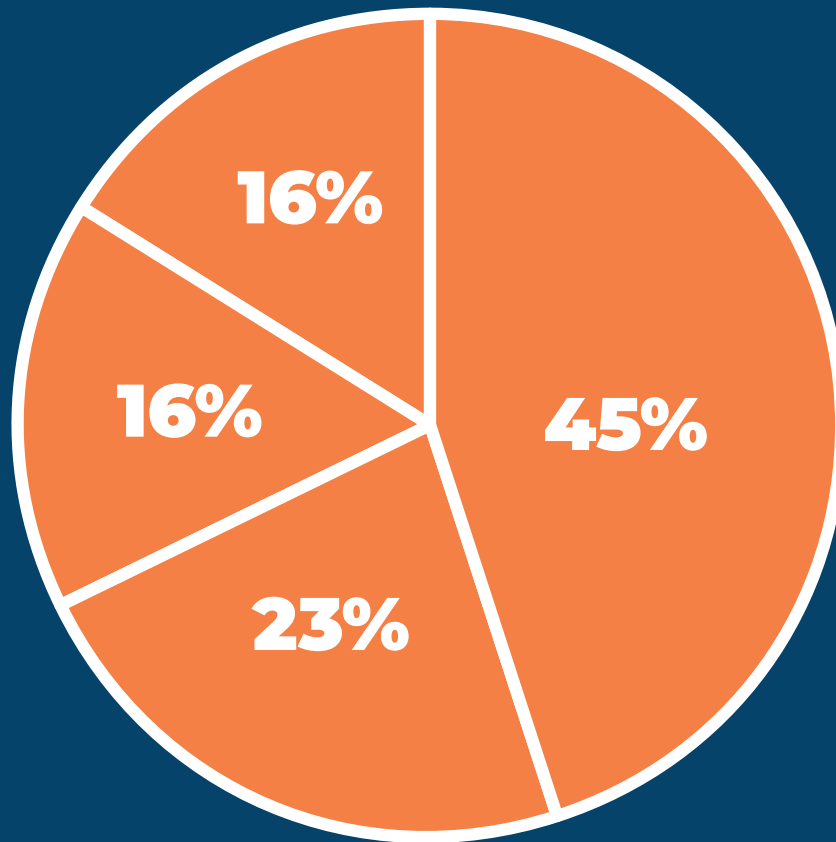
Stanly Community College

Stanly Community College will use grant funds to purchase and distribute exam vouchers to students for CompTIA Security+ and Exterro Accessdata Certified Examiner Certifications.

Wayne Community College

This project aims to increase the number of skilled Cybersecurity workers to meet regional workforce demands. Funds will support a campaign to raise awareness of cybersecurity as a career field and provide scholarships to students with the goal of increasing enrollment, retention, and completion of students in the program. This will create work-ready employees that will help close the skills gap for in-demand jobs that currently go unfilled.

Budget Allocation



45% **SUBGRANTS TO MEMBER SCHOOLS**
Awarded to Eight Member Schools

23% **CORE SERVICES**
Finance and Accounting, Marketing,
Grant Administration, Project Management

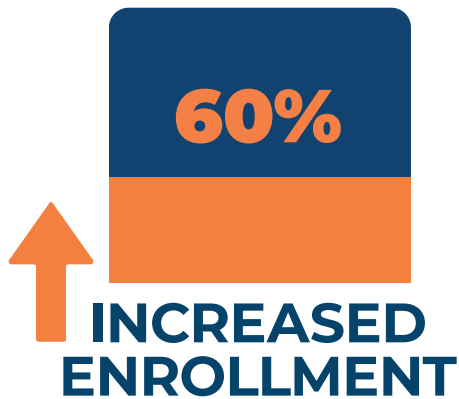
16% **MEMBER SERVICES**
CAE Support, Shared Resources, Convenings

16% **EDUCATION AND TRAINING**
Academies, ELS, Scholarships, SOC

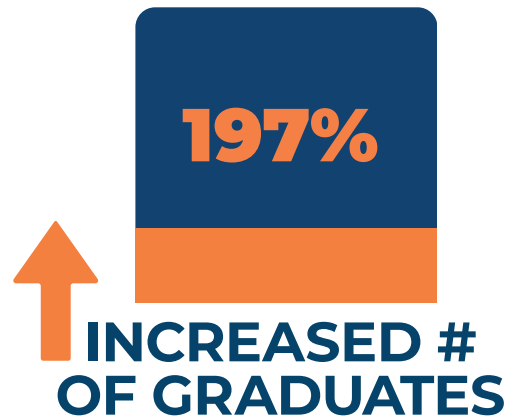
Measuring Performance - KPIs

Data from Initial 11 Member Schools 2018-2022

Baseline activity of 2018-2019 to measure against pre-pandemic performance



Total number of students enrolled in credit programs increased by 60% (from 640 in 2018-2019 to 1,026 in 2021-2022).



Total number of graduates increased by 197% (from 90 in 2018-2019 to 267 in 2021-2022).

Data from Current 14 Member Schools 2021-2022

CYBERSECURITY GRADUATES

381 Degree, Diploma, or Certificate

ENROLLED STUDENTS

1,856 Credit

278 Non-Credit

SCHOOLS REPORTING THEY ADDED OR UPDATED COURSES

62% Blue Ridge, Fayetteville Tech, Forsyth, Gaston, Montreat, NC A&T, Richmond, Stanly, Wayne

CAE DESIGNATED SCHOOLS

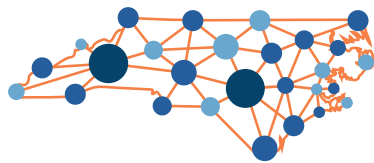
9 Additional 4 Schools Have CAE Designation Process Underway and 2 Recertified

169 Students completed at least one non-credit course

150 High school students enrolled in a cybersecurity course

153 Students participated in work-based learning, including internships and apprenticeships

Annual Report 2022



**CAROLINA
CYBER
NETWORK**

**Developing Talent
Protecting Our Future**

carolinacybernetnetwork.net