2020
EDITION

NATIONAL CENTERS OF ACADEMIC EXCELLENCE IN CYBERSECURITY
JOURNAL

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Introduction

As Commandant of the National Cryptologic School at the National Security Agency, I see the impact of cybersecurity education every day and I am proud of the work that the National Centers of Academic Excellence are doing. You are educating the nation's cyber first responders, an essential role in a world that relies so heavily, if not almost exclusively, on cyber technology.

Cyber is a team sport and you are on the front lines building a future cadre of cybersecurity experts, who will keep our Nation safe. NSA, as well as our partners at the Department of Homeland Security, the National Institute of Standards and Technology, the National Science Foundation, and the Federal Bureau of Investigation are committed to working alongside you to secure our Nation's future.

NSA launched the Centers of Academic Excellence in Information Assurance, now Cyber Defense, Education program in 1999, with the intent to contribute to the growing demand for cybersecurity expertise in the workforce. Growing from seven institutions to 334 CAE-CD institutions today, the program has developed with energy, enthusiasm and creativity. While the program has evolved over the years – most recently merging with NSA's CAE in Cyber Operations Program to become the National Centers of Academic Excellence in Cybersecurity – our focus will remain the same: to promote higher education and research in cybersecurity; to develop agile cybersecurity professionals to fight the cyber threats our country faces.

NSA cannot do this alone - we are proud to work in concert with the CAEs, government and industry! The whole country benefits from the work done by CAE institutions and the powerful sharing that occurs. NSA appreciates raising of the bar in cyber education!

Ms. Diane M. Janosek
Commandant, National Cryptologic School
National Security Agency

National Centers of Academic Excellence (NCAE) Mission

The mission of the National Centers of Academic Excellence in Cybersecurity (NCAE) program is to create and manage a collaborative cybersecurity educational program with community colleges, colleges, and universities that:

- Establishes standards for cybersecurity curriculum and academic excellence
- Includes competency development among students and faculty
- Values community outreach and leadership in professional development
- Integrates cybersecurity practice within the institution & across academic disciplines
- Actively engages in solutions to challenges facing cybersecurity education

History of the Program

NSA launched the National Centers of Academic Excellence in Information Assurance (IA) Education program in 1999. The program was envisioned to contribute to the growing demand for cybersecurity expertise in the intelligence community workforce. Over the years, as it became clear cyber defense would become an integral element of national security, the program's objectives expanded to support the nation's need for cybersecurity workforce development.

The program originally called for schools to map their information assurance curriculum to Committee on National Security Systems (CNSS) standards. The first created was CNSS 4011, which outlined the minimum knowledge required of IA professionals to execute their craft and served as the foundation for the CAE in IA Education Program. As the CNSS developed subsequent standards (CNSSIs 4012-6), institutions were given the opportunity to map to them. Once successfully mapped, institutions received a certificate through the Information Assurance Curriculum Evaluation (IACE) program. Receiving IACE endorsement was the first step to CAE designation. The program began the transition from using CNSS standards to developing and implementing a new Knowledge Unit (KU) structure that more accurately reflected the state of cybersecurity and technology in 2012. Applicants began using the new KUs for designations in 2014 and by 2017, every academic institution in the program had made the transition.

From the beginning, the CAE designation was based on both curriculum and program criteria. The criteria speak to the institution's commitment to joining the CAE-CD program, practicing what they teach, maintaining quality faculty to ensure a lasting academic program, outreach to high schools and others in need of IA expertise, and commitment to developing the profession. Once an institution received

their IACE endorsement, they continued in the second stage to document the program criteria. When the program evolved to using KUs, the two-stage process merged into one application.

The first seven institutions to receive the designation were James Madison University, George Mason University, Idaho State University, Iowa State University, Purdue University, University of California, Davis, and University of Idaho. These seven schools were instrumental in developing information assurance curriculum in its infancy. Textbooks had yet to be written on the topic, so these first seven schools formed a bond and shared resources to begin building a community that has grown to 334 schools across the country.

Over the years, the CAE Program Management Office has undergone many enhancements in order to keep up with the cyber landscape. Some of the more notable changes include the introduction of the DoD Information Assurance Scholarship Program (2001), the addition of DHS as a partner (2004), the addition of the Research designation (2008), and the Two-Year Education (2010) designation. In the 2017 National Defense Authorization Act (NDAA), Congress changed Information Assurance to Cyber Defense, thus changing the program name to CAEs in Cyber Defense.

California State University San Bernardino receiving their CAE-IAE certificate

In collaboration with the CAE Community, the CAE-CD Program Office changed the process for curriculum mapping and titles of the designation in 2018. The Program Office and the designated schools met in a series of workshops to address an update of the program's Knowledge Unit (KU) structure and content, and in the process, reached consensus on changing the academic requirements for designation. This update was driven by the need to distinguish between Bachelors and graduate degrees, as well as the relationship of types and numbers of KUs at each level of recognition.

Without substantive change to the KUs themselves, the curriculum mapping requirements evolved. The new process gave all designating institutions the opportunity to individualize their programs and reflect their programs' expertise within their designation. This also makes it easier for students, employers, and educators to identify the focus of each designated program and how those programs map to the National Initiative for Cybersecurity Education (NICE) Workforce Framework categories and work roles. The program office implemented this new paradigm in the 2019 application cycle (October 2018 to May 2019). Until the automated tool used for applications is updated, the list of institutions on the CAE-CD web page will continue to list the original CAECDE, CAE-2Y, and CAE-R designations.

In October 2019, the CAE in Cyber Defense program merged with the CAE in Cyber Operations program. The latter program was established in 2012 to support the President's National Initiative for Cybersecurity Education (NICE): Building a Digital Nation, and furthers the goal to broaden the pool of skilled workers capable of supporting a cyber-secure nation. The CAE-CO program is a deeply technical, inter-disciplinary program firmly grounded in computer science, computer engineering, and/or electrical engineering disciplines. It complements the CAE-CD program, providing a particular emphasis on technologies and techniques related to specialized cyber operations to enhance the national security posture of our Nation.

Also in 2019, the decision was made to shift to an outcome-based designation process - a combination of elements related to the institution

The University of Washington receiving their CAE-Cyber Defemse Education certificate

that is focused on outputs for determining academic achievement. This combination assures that the institution meets the desired characteristics of a CAE institution, and that the academic delivery to students is producing the qualified workforce needed by the nation.
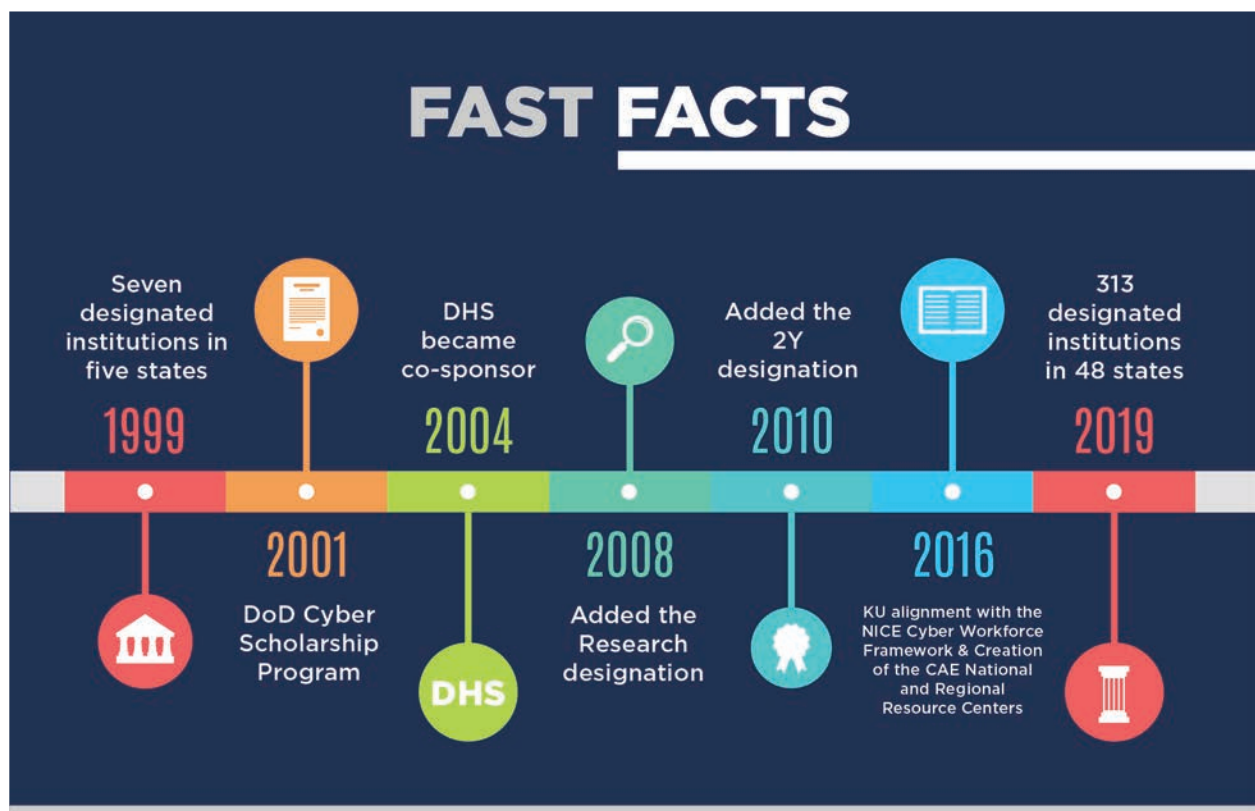
As of September 1 2020, there are 334 designated institutions across 48 states, the District of Columbia, and Puerto Rico. There are 116 Community Colleges offering Associate programs and degrees. Many of our designees hold multiple designations; 48 hold both CAE-CDE and CAE-R designations, six hold both CAE-CDE and CAE in Cyber Operations (CAE-CO), two hold CAE-R and CAE-CO, and ten hold all three designations: CAE-CDE, CAE-R, and CAE-CO. Though the program has evolved through the years, our focus has always been and will continue to be, to promote higher education and research in cyber defense and produce professionals with cyber defense expertise in order expand to the cybersecurity workforce and to reduce vulnerabilities in our national infrastructure.

Moraine Valley Community College receiving their CAE-2Y certificate

West Virginia University receiving their CAE-R certificate

FAST FACTS

Seven designated institutions in five states
1999

2001
DoD Cyber Scholarship Program

DHS became co-sponsor
2004

2008
Added the Research designation

Added the 2Y designation
2010

2016
KU alignment with the NICE Cyber Workforce Framework & Creation of the CAE National and Regional Resource Centers

313 designated institutions in 48 states
2019

The National Centers of Academic Excellence in Cybersecurity Today

Academic institutions may choose from three designations.

- **The Cyber Defense Education (CAE-CDE)** designation is awarded to regionally accredited academic institutions offering cybersecurity degrees and/or certificates at the Associates, Bachelors and graduate levels.

- **The Cyber Research (CAE-R)** designation is awarded to DoD schools, PhD producing military academies, or regionally accredited, degree granting four-year institutions rated by the Carnegie Foundation Basic Classification system as either a Doctoral University – Highest Research Activity (R1), Doctoral University – Higher Research Activity (R2), or Doctoral University – Moderate Research Activity (R3).

- **The Cyber Operations (CAE-CO)** program is a deeply technical, inter-disciplinary, higher education program firmly grounded in the computer science, computer engineering, and/or electrical engineering disciplines, with extensive opportunities for hands-on applications via labs and exercises.

The designation process is a combination of elements related to the institution focused on outputs for determining academic achievement. This combination assures that the institution meets the desired characteristics of a CAE institution, and that the academic delivery to students is producing the qualified workforce needed by the nation.

CAE-designated institutions must complete validation of a Program of Study (PoS) which is a series of courses and experiences that a student can reasonably accomplish in the course of attaining a degree or completing a certificate.

CAE Core Values and Guiding Principles

- **Ethics:** The school must encourage and support ethical behavior by students, faculty, administrators, and professional staff.

- **Share:** The institution enables an environment in which students, faculty, administrators, professional staff, and practitioners can share, interact, and collaborate with others in the cybersecurity field.

- **Lead by Example:** The institution demonstrates a commitment to address, engage, and respond to current and emerging cybersecurity issues both in the classroom and in the institution itself.

CAE-CD Designations

CAE in Cyber Defense Research (CAE-R)

All CAE in Cyber Defense Research (CAE-R) applicants must be either a DoD school, a PhD producing military academy, or a regionally accredited, degree-granting four-year institution. They must be rated as either a Doctoral University – Highest Research Activity (R1), a Doctoral University – Higher Research Activity (R2), or a Doctoral University – Moderate Research Activity (R3) as determined by the Carnegie Foundation Basic Classification system (and/or other independent body to measure CD) or provide a written justification outlining their significant CD research.

The CAE-R criteria includes the demonstration of CD Research initiatives (faculty and student), publications, graduate-level production, and research funding.

CAE in Cyber Defense Education (CAE-CDE)

There are four levels of the CAE-CDE designation: Associate, Bachelor, Master, and Doctoral.

Institutions wishing to be designated a *Center of Academic Excellence in Cyber Defense Education (CDE)* or *Cyber Operations (CO)* for a particular program of study apply in two parts.

The following process applies to both Program of Study Validation (PoS) and CAE Designation. In Step 5 (fig. 1), the applicant appears before the Review Committee by webinar for the PoS validation, and in person for the CAE Designation review.

- ***Program of Study Validation.*** The process begins with the submission of elements pertaining to the academic program of study, including curriculum, faculty profiles and qualifications, maturing of the program, and so on. An institution may opt to have multiple programs of study validated before pursuing designation, or may achieve designation and return to have additional programs of study validated.

- ***CAE Designation.*** Once one program of study has been validated, the institution may pursue a designation. To be eligible for designation, academic institutions must hold a current regional accreditation as outlined by the Department of Education (*https://www.ed.gov/accreditation*).

Timelines for submission are published by the CAE-C Program Management Office (PMO), and are spread throughout the year. The program office will make available an automated application tool to collect all required documentation and data. The application tool will collect required metrics and allow upload of required documentation.

Qualified Cyber professionals and Subject Matter Experts from CAE Academic Institutions, NSA, DHS, and other government and industry partners will assess applications. By submitting an application, an institution grants consent to having its application reviewed by assessors approved by the CAE Program Office. Institutions not meeting requirements will receive reviewer feedback at the time of notice. Reviewer feedback is available upon request for approved submissions by contacting the program office at AskCAEIAE@nsa.gov. Incomplete applications will be returned without comment. Designation as a National CAE-C does not carry a commitment of funding.

Expectations of Designated Institutions

✓ Submit an annual update with all required information. Be available to discuss responses should the CAE Program Office have questions about any submitted information.

✓ Attendance at the CAE Community Symposium or CAE Principals Meeting each year. If attendance isn't feasible in a particular year, contact the CAE Program Management Office (caepmo@nsa.gov) for a suitable alternative.

✓ Represent institution by participating in CAE Program activities and projects and maintaining regular communication with the CAE Program Management Office and the CAE Community. This includes, but is not limited to:

> Acting as a Mentor, Advisor, or Reviewer
> Participating in a Working Group
> Provide timely input on questions and projects managed by the CAE PMO
> Contribute curriculum, time, and resources in support of the CAE Community as a whole
> Share expertise via a CAE Forum or Tech Talk.

✓ Maintain institution information in the application tool. Update the appropriate Point of Contact and President information is regularly to ensure PMO correspondence is received by the intended recipients.

✓ Virtually attend at least one CAE Tech Talk or CAE Forum calendar year.

✓ Answer annual call for CAE Program Book updates.
   (View current version here: *www.caecommunity.org/content/cae-marketing-materials*).

CAE-CD Candidate Program

As awareness of the crisis in cybersecurity workforce began to grow, so did interest in the CAE-CD program. In the early years of the program, academic institutions were on their own to interpret designation requirements and successfully apply for designation. While the program office could answer specific questions, there was no concerted means that allowed interested institutions to get help in developing their programs or interpreting the application process. As a result, success in first time applications was about 57%.

In 2015, the National Science Foundation awarded the Catalyzing Computing and Cybersecurity in Community Colleges (C5) grant. As a co-PI on this grant, Whatcom Community College, Bellingham, WA, implemented a mentoring program to help community colleges pursue CAE-2Y. In an effort to use CAE Program Office resources most effectively, maintain fiscal responsibility, and encourage the growth of exceptional cybersecurity education programs, the CAE-CD program introduced the CAE-CD Candidate Program in 2016 and expanded assistance to all schools seeking the Cyber Defense Education designation. The mentoring opportunities offered in the Candidates Program are based on the C5 model and lessons learned.

The CAE-CD Candidate Program ensures applicant institutions have adequate opportunity for

program development and application assistance prior to submitting an application. It is designed to reduce the time required to earn the designation, help new participants understand the depth and breadth of the program and designation requirements, and facilitate the sharing of experience and resources between institutions already designated and aspirants via mentorship opportunities. Depending on the maturity of the program, institutions are placed in either Program Development or Application Assistance.

Program Development is recommended for institutions needing further development of programs and/or curriculum, or for those with programs that have not reached maturity. Assistance and advice within this path are provided primarily by regional CAE Resource Centers. Candidate institutions have access to workshops and seminars and are invited to programs and events hosted by the CAE Community.

Institutions assessed to be within one year of meeting curriculum and programmatic criteria are referred to the Application Assistance path for mentorship. Institutions in this phase also have access to workshops and seminars and are invited to programs and events hosted by the CAE Community. Application Assistance is designed to help new applicants interpret and document the depth of program and designation requirements and is the element of the Candidate Program modeled after C5.

Following implementation of the Candidate Program, the applicant success rate rose to 87% in the first year.

CAE National Centers (CNCs) and CAE Regional Hubs

The program office established the CAE National Resource Centers (CNRC) and CAE Regional Resource Centers (CRRC) in 2017 to provide an infrastructure among CAE-designated schools in different geographic regions. This support infrastructure was crucial to continued growth and efficacy of the CAE-CD program. Its success is a testament to the power of collaboration and cooperation, development of an academic community, shared resources, and shared goals.

In 2020, the program office is using lessons learned from three years of the original structure to slightly re-organize the infrastructure so that the organization is more sustainable financially, but continues to provide the best support to the CAE Community.

Five Regional Hubs will replace the CRRCs to support both institutions with designated programs and candidate institutions in a particular geographic region. They will continue to host a variety of program and faculty professional development workshops, seminars and courses, and facilitate collaboration in the region. The Hubs are teams of community colleges and universities who collectively provide support to the region, lead the CAE Competition program, and collaborate with the CAE National Centers and the program office to support the CAE Community.

The CAE National Centers will continue to provide specialty assistance and leadership to the CAE Community in the areas of resource management, standards development and management, mentoring and peer review. The program office depends on the CNCs to provide feedback and input for strategic planning, standards currency, and review of applications. This structure ensures separation of advice and mentorship from evaluation and designation.

There are three CAE National Centers providing community support, management of the Candidates program, and management of the peer reviewer and adjudication process in collaboration with the program office.

DoD Cyber Scholarship Program (CySP)

The Department of Defense (DoD) Information Assurance Scholarship Program (IASP) was created in 2001 to provide scholarship grants to CAE-designated schools in an effort to encourage qualified students to start their careers at the Department of Defense. In the 2018 National Defense Authorization Act, Congress changed the name to the Cybersecurity Scholarship Program (CySP). Similar to the National Science Foundation's CyberCorps scholarship program, CySP is Scholarship For Service (SFS), allowing students to pay back their scholarship with service for a time equivalent to the length of their scholarship. Since its inception in 2001, this program has provided over $92 million for scholarships and education capacity and supported 686 scholars at 105 CAE-CD institutions. The program continues to be administered by the CAE-CD Program Management Office and overseen by the DOD Chief Information Officer.

There are two scholarship opportunities within CySP. Recruitment students are new students recruited by the CAEs for this program. Retention students are military members and DoD civilians pursuing a degree. All undergraduate students are required to maintain a 3.2 grade point average and graduate students a 3.5 grade point average. All students incur a service commitment equal to the number of years they receive a scholarship. Students must be US citizens and must qualify for a security clearance. The CAE-CD or CAE-CO faculty member must provide a recommendation and endorsement of the veracity of the application.

Recruitment students receive the full cost of tuition, books required for the program, required fees (including health care), and a stipend to cover room and board. In FY2019, the stipend levels are $20,000 for community college students (pilot program), $25,000 for undergraduate students and $30,000 for graduate (Master's/PhD) students. Other benefits include:

- Academic scholarships covering **full tuition, applicable fees, and books**
- Paid **Internships** in cyber roles at the DoD
- **Travel expenses** for cyber conferences and other learning and networking opportunities
- **A cyber-related job within the DoD following graduation** (pending clearance)

Retention students are recruited by their DoD employer organization. The organization must commit to giving the student approval for possible time away from the job so the student may attend one of the full-time programs or provide a flexible work schedule to allow part-time opportunities. They also must have positions available that will utilize the student's degree. There are three programs available to retention students:

- National Defense University College of Information and Cyber + Partner CAE (open to graduates of select College of Information and Cyberspace (CIC) certificate programs). NDU collaborates with CAE-designated schools; students attend a short program at NDU, and then finish at the CAE school
- Air Force Institute of Technology
- Naval Postgraduate School

Students selected as Cyber Scholars will receive the full cost of tuition, required books, required fees, and potential travel for degree specific events. Retention Scholars will continue to receive 26 Centers of Academic Excellence in Cyber Defense Publication their DoD/Military pay and will be required to perform a service obligation to their parent agency or component.

Grants

The CAE-CD program has not had funding to provide grants in every fiscal year, but periodically receives funding from Congress to accelerate growth of the program and encourage research. In FY2015, Congress allocated six million for research, which was subsequently awarded to CAE-CD designated institutions. In FY2016, Congress allocated one million for grants to CAE-2Y designated institutions. Part of this funding was used to establish the first six CRRCs. In FY17, the program received $25 million from the President's budget, which facilitated establishment of the CNRCs and remaining three CRRCs in addition to allowing the program office to issue 45 grants for projects at designated institutions. A database with information on all of these grants, their POCs, and a short description of the project is now available on the CAE Community website (caecommunity.org) to those qualifying for a CAE Community account.

Federal Partners

NCAE program success is due in large part to federal departments and agencies that are close partners in cybersecurity workforce education and development. In addition to the program office partnership with DoD CIO on CySP, close partners include:

- **Department of Homeland Security (DHS), Cybersecurity and Infrastructure Security Agency (CISA).** CISA helps foster the growth of the program as part of their outreach to states and local communities. CISA also manages the National Initiative for Cybersecurity Careers and Studies (NICCS) and offers free online cybersecurity education to federal employees and military through the Federal Virtual Training Environment (VTE). Visit niccs.us-cert.gov for more information.

- **The Federal Bureau of Investigation (FBI)** serves as a strategic advisor for the Cyber Operations Program. FBI participates in training and education conferences, symposia, and working groups to address cybersecurity education and training, and co-sponsor, as appropriate, events, working groups and principals' meetings. FBI provides subject matter expertise, participates in the review of college and university applicants for designation. Additionally, the FBI participates in the Summer Intern Program. Through the NSA CAE partnership initiative, the FBI provides technical liaisons to universities associated with the FBI and NSA's Centers of Academic Excellence in Cyber Operations schools. The intended purpose is to enhance relationships, identify potential partnerships on research and innovation.

- **The National Initiative for Cybersecurity Education (NICE).** As part of the National Institute of Standards and Technology (NIST) in the Department of Commerce, NICE focuses on efforts to close the hiring gap in the cybersecurity workforce. The Annual CAE Community Symposium is supported by a grant from NICE. The NICE Challenge Project, which develops real world cybersecurity tasks that are aligned to the NICE Cybersecurity Workforce Framework presented

within virtualized business environments bring students the workforce experience before entering the workforce, is funded by NICE and the NSA College of Cyber. The CAE-CD program office participates with the NICE Interagency Coordinating Council, which offers opportunities for federal departments and agencies to share information and collaborate on areas of common interest. CAE-CD KUs are mapped to the NICE Framework, and designated programs align to the NICE Framework Specialty Areas. Visit nist.gov/nice for more information.

- **United States Cyber Command (USCYBERCOM)** is partnered with the National Security Agency academic engagement programs to build cyber mission and Department of Defense cyber workforce. USCYBERCOM is focused on academic partnership through existing partners to create cyber talent development competencies and skills across the force. Currently, USCYBERCOM is developing outreach to academic partners around designated critical work roles and critical training/education infrastructure to enable cyber skills, knowledge and attributes associated with academic knowledge units and experiential cyber programs.

- **The National Science Foundation (NSF)** encourages and funds projects that will generate new knowledge about effective cybersecurity education, re-skill workers to meet cybersecurity education needs, prepare nontraditional students to reenter the educational system, increase the diversity of the cybersecurity workforce, use applied research experiences to build skills and www.iad.gov/NIETP 27 competencies for real-world scenarios, and build effective collaborations between educational institutions, business, industry, and government. NSF and CAE-CD interests frequently align, and the CAE-CD program has benefited from the NSF investment on numerous occasions. For more information, visit www.nsf.gov. Most closely related to the CAE-CD are:

    ▷ The CyberCorps®: Scholarship for Service (SFS) program. The SFS program, co-sponsored by the U.S. Office of Personnel Management (OPM), and Department of Homeland Security (DHS), includes scholarship and capacity-building components that attract high-caliber students from institutions designated by the CAE-CD program and selected by NSF through a competitive process.

    ▷ The National Defense Authorization Act for Fiscal Year 2018 gave NSF, in coordination with the Office of Personnel Management, authorization to develop and implement a C3P program as part of NSF's CyberCorps®: Scholarship for Service (SFS) program. Specifically, the act authorizes scholarships for students who are bachelor's degree recipients or veterans of the Armed Forces, or who are pursuing associate degrees or specialized program certifications in the field of cybersecurity. Five CAE-CD designated institutions are participating C3P.

    ▷ NSF also manages the Advanced Technological Education (ATE) program, which is currently funding centers in eight major technology areas. Two ATE programs, the National Center for Systems Security and Information Assurance (CSSIA) and NCyTe are designated CAE-CDEs.

Academic Institutions Offering CAE-CD Designated Programs

As of September 1 2020, there are 334 designated institutions across 48 states, the District of Columbia, and Puerto Rico. There are 116 Community Colleges offering Associate programs and degrees. Many of our designees hold multiple designations; 48 hold both CAE- CDE and CAE-R designations, six hold both CAE-CDE and CAE in Cyber Operations (CAE- CO), two hold CAE-R and CAE-CO, and ten hold all three designations: CAE-CDE, CAE-R, and CAE-CO.

Degree and certificate paths range from concentrations in cybersecurity to bachelors and masters in cybersecurity and cyber defense. Top research focus areas are Hardware Security, Cryptology, Digital Forensics, and Network Hardening.

Designated institutions were invited to provide profiles of their programs for this publication. Those who were able to do so according to the publication deadlines are profiled alphabetically in this section. The following is an alphabetical list of designated programs by institution name, with their state. For a listing of institutions by state, or for more information, visit
www.iad.gov/NIETP/reports/cae_designated_institutions.cfm

Designated Programs by Institution

Air Force Institute of Technology .... Ohio
Alamance Community College .... North Carolina
American Public University System .... West Virginia
Anne Arundel Community College .... Maryland
Arapahoe Community College .... Colorado
Arizona State University .... Arizona
Athens State University .... Alabama
Auburn University .... Alabama
Augusta Technical College .... Georgia
Augusta University .... Georgia
Baker Colleg .... Michigan
Bellevue University .... Nebraska
Binghamton University .... New York
Bismarck State College .... North Dakota
Bloomsburg University of Pennsylvania .... Pennsylvania
Blue Ridge Community & Technical College .... West Virginia
Bluegrass Community and Technical College .... Kentucky
Bossier Parish Community College .... Louisiana
Boston University .... Massachusetts
Bowie State University .... Maryland
Brigham Young University .... Utah
Brookdale Community Collge .... New Jersey
Butler Community College .... Kansas
Calhoun Community College .... Alabama
California State Polytechnic University, Pomona .... California
California State University San Marcos .... California
California State University, Sacramento .... California
California State University, San Bernardino .... California
Capella University .... Minnesota
Capitol Technology University .... Maryland
Carnegie Mellon University .... Pennsylvania
Cecil College .... Maryland
Cedarville University .... Ohio
Central New Mexico Community College .... New Mexico
Century College .... Minnesota
Champlain College .... Vermont
Chemeketa Community College .... Oregon
City College of San Francisco .... California
City University of Seattle .... Washington
Clark State Community College .... Ohio
Clemson University .... South Carolina
Coastline Community College .... California
College of DuPage .... Illinois
College of Southern Maryland .... Maryland
College of Southern Nevada .... Nevada
Colorado School of Mines .... Colorado
Colorado State University-Pueblo .... Colorado
Colorado Technical University .... Colorado
Columbia Basin College .... Washington
Columbus State Community College .... Ohio
Columbus State University .... Georgia
Community College of Rhode Island .... Rhode Island
County College of Morris .... New Jersey

Cypress College .... California
Dakota State University .... South Dakota
Danville Community College .... Virginia
Dartmouth College .... New Hampshire
Davenport University .... Michigan
Daytona State College .... Florida
Delta College .... Michigan
DePaul University .... Illinois
Drexel University .... Pennsylvania
East Carolina University .... North Carolina
East Stroudsburg University .... Pennsylvania
Eastern Michigan University .... Michigan
ECPI University .... Virginia
Edmonds Community College .... Washington
El Paso Community College .... Texas
Embry-Riddle Aeronautical University – Daytona .... Arizona
Embry-Riddle Aeronautical University – Prescott .... Florida
ENMU – Ruidoso Branch Community College .... New Mexico
Estrella Mountain Community College .... Arizona
Excelsior College .... New York
Fairleigh Dickinson University .... New Jersey
Fayetteville Technical Community College .... North Carolina
Ferris State University .... Michigan
Florida A&M University .... Florida
Florida Atlantic University .... Florida
Florida Institute of Technology .... Florida
Florida International University .... Florida
Florida State College at Jacksonville .... Florida
Florida State University .... Florida
Fordham University .... New York
Forsyth Technical Community College .... North Carolina
Fort Hays State University .... Oklahoma
Franklin University .... Ohio
George Mason University .... Virginia
Georgetown University .... District of Columbia
Georgia Institute of Technology .... Georgia
Georgia Southern University – Armstrong .... Georgia
Georgia State University .... Georgia
Germanna Community College .... Virginia
Glendale Community College .... California
Grand Canyon University .... Arizona
Grand Rapids Community College .... Michigan
Great Falls College Montana State University .... Montana
Green River College .... Washington
Hagerstown Community College .... Maryland
Hampton University .... Virginia
Harford Community College .... Maryland
Henry Ford College .... Michigan
Highline College .... Washington
Hill College .... Texas
Honolulu Community College .... Hawaii
Houston Community College .... Texas
Howard Community College .... Maryland

Idaho State University .... Idaho
Illinois Institute of Technology .... Illinois
Illinois State University .... Illinois
Indian River State College .... Florida
Indiana University of Pennsylvania .... Pennsylvania
Indiana University .... Indiana
Iowa State University .... Iowa
Ivy Tech Community College .... Indiana
Jackson State Community College .... Tennessee
Jacksonville State University .... Florida
James Madison University .... Virginia
John A Logan College .... Illinois
Johnson County Community College .... Kansas
Kansas State University .... Kansas
Kennesaw State University .... Georgia
Lake Superior College .... Michigan
Lansing Community College .... Michigan
Laredo College .... Texas
Leeward Community College .... Hawaii
Lehigh Carbon Community College .... Pennsylvania
LeMoyne–Owen College .... Tennessee
Lewis University .... Illinois
Liberty University .... Virginia
Lincoln Land Community College .... Illinois
Long Beach City College .... California
Lord Fairfax Community College .... Virginia
Louisiana Tech University .... Louisiana
Loyola University Chicago .... Illinois
Macomb Community College .... Michigan
Madison College .... Wisconsin
Marquette University .... Wisconsin
Marymount University .... Texas
McLennan Community College .... Texas
Mercy College .... New York
Metropolitan Community College .... Nebraska
Metropolitan Community College – Kansas City .... Missouri
Metropolitan State University .... Minnesota
Middle Georgia State University .... Georgia
Mississippi State University .... Mississippi
Missoula College .... Montana
Missouri University of Science and Technology .... Missouri
Mohawk Valley Community College .... New York
Montreat College .... North Carolina
Moraine Valley Community College .... Illinois
Morgan State University .... Maryland
Mountain Empire Community College .... Virginia
Mt. Hood Community College .... Washington
Murray State University .... Kentucky
National University .... California
Naval Postgraduate School .... California
New England Institute of Technology .... Rhode Island
New Jersey City University .... New Jersey
New Jersey Institute of Technology .... New Jersey
New Mexico Tech .... New Mexico
New York Institute of Technology .... New York
New York University .... New York
Norfolk State University .... Virginia

North Carolina A&T State University .... North Carolina
North Carolina State University .... North Carolina
North Dakota State University .... North Dakota
North Idaho College .... Idaho
Northeast Community College .... Nebraska
Northeastern University .... Massachusetts
Northern Kentucky University .... Kentucky
Northern Virginia Community College .... Virginia
Norwich University .... Vermont
Nova Southeastern University .... Florida
Oakland University .... Michigan
Ohlone College .... California
Oklahoma City Community College .... Oklahoma
Oklahoma State University .... Oklahoma
Old Dominion University .... Virginia
Our Lady of the Lake University .... Texas
Owensboro Community and Technical College .... Kentucky
Pace University .... New York
Pennsylvania Highlands Community College .... Pennsylvania
Pennsylvania State University .... Pennsylvania
Pikes Peak Community College .... Colorado
Pitt Community College .... North Carolina
Pittsburgh Technical College .... Pennsylvania
Polytechnic University of Puerto Rico .... Puerto Rico
Portland Community College .... Oregon
Portland State University .... Oregon
Prince George's Community College .... Maryland
Pueblo Community College .... Colorado
Purdue University .... Indiana Purdue
University Northwest .... Indiana
Radford University .... Virginia
Red Rocks Community College .... Colorado
Regent University .... Virginia
Regis University .... Colorado
Roane State Community College .... Tennessee
Robert Morris University .... Illinois
Rochester Institute of Technology .... New York
Rock Valley College .... Illinois
Rockland Community College .... New York
Roosevelt University .... Illinois
Rose State College .... Oklahoma
Rutgers, The State University of New Jersey .... New Jersey
Saint Leo University .... Florida
Saint Vincent College .... Pennsylvania
Sam Houston State University .... Texas
Sampson Community College .... North Carolina
San Antonio College .... Texas
Sierra College .... California
Sinclair Community College .... Ohio
Snead State Community College .... Alabama
South Carolina State University .... South Carolina
South Texas College .... Texas
Southeast Missouri State University .... Missouri
Southern Maine Community College .... Maine
Southern Methodist University .... Texas
Southern Utah University .... Utah
Southwest Virginia Community College .... Virginia

Spokane Falls Community College .... Washington
St. Cloud State University .... Minnesota
St. Louis Community College .... Missouri
St. Petersburg College .... Florida
St. Philip's College .... Texas
Stevens Institute of Technology .... New Jersey
Syracuse University .... New York
Tennessee Tech University .... Tennessee
Terra State Community College .... Ohio
Texas A&M University .... Texas
Texas A&M University – Corpus Christi .... Texas
Texas A&M University – San Antonio .... Texas
Texas State Technical College in Harlingen .... Texas
The Citadel .... South Carolina
The Community College of Baltimore County .... Maryland
The George Washington University .... District of Columbia
The Johns Hopkins University .... Maryland
The Ohio State University .... Ohio
The University of Alabama at Birmingham .... Alabama
The University of Alabama in Huntsville .... Alabama
The University of Alabama .... Alabama
The University of Arizona, Tucson .... Arizona
The University of Tennessee at Chattanooga .... Tennessee
The University of Texas at Austin .... Texas
The University of Texas at San Antonio .... Texas
Thomas Nelson Community College .... Virginia
Tidewater Community College .... Virginia
Towson University .... Maryland
Trident Technical College .... South Carolina
Tuskegee University .... Alabama
United States Air Force Academy .... Colorado
United States Naval Academy .... Maryland
University at Albany, the State Uniniversity of New York .... New York
University at Buffalo, the State University of New York .... New York
University of Advancing Technology .... Arizona
University of Arkansas .... Arkansas
University of Arkansas at Little Rock .... Arkansas
University of California, Davis .... California
University of California, Irvine .... California
University of Central Florida .... Florida
University of Cincinnati .... Ohio
University of Colorado, Colorado Springs .... Colorado
University of Connecticut .... Connecticut
University of Dallas .... Texas
University of Delaware .... Delaware
University of Denver .... Colorado
University of Detroit, Mercy .... Michigan
University of Florida .... Florida
University of Georgia .... Georgia
University of Hawai'i – Manoa .... Hawai'i
University of Hawai'i – Maui College .... Hawai'i
University of Hawai'i – West O'ahu .... Hawai'i
University of Houston .... Texas
University of Idaho .... Idaho
University of Illinois at Springfield .... Illinois
University of Illinois, Urbana-Champaign .... Illinois
University of Kansas .... Kansas

University of Louisville, Kentucky .... Kentucky
University of Maine at Augusta .... Maine
University of Maryland Global Campus .... Maryland
University of Maryland, Baltimore County .... Maryland
University of Maryland, College Park .... Maryland
University of Massachusetts Lowell .... Massachusetts
University of Memphis .... Tennessee
University of Missouri – Columbia .... Missouri
University of Missouri – St. Louis .... Missouri
University of Nebraska, Omaha .... Nebraska
University of Nevada, Las Vegas .... Nevada
University of Nevada, Reno .... Nevada
University of New Hampshire .... New Hampshire
University of New Haven .... Connecticut
University of New Mexico .... New Mexico
University of New Orleans .... Louisiana
University of North Carolina, Charlotte .... North Carolina
University of North Carolina, Wilmington .... North Carolina
University of North Florida .... Florida
University of North Georgia .... Georgia
University of North Texas .... Texas
University of Pittsburgh .... Pennsylvania
University of Rhode Island .... Rhode Island
University of South Alabama .... Alabama
University of South Carolina .... South Carolina
University of South Florida .... Florida
University of Texas at Dallas .... Texas
University of Texas at El Paso .... Texas
University of the Cumberlands .... Kentucky
University of Tulsa .... Oklahoma
University of Virginia .... Virginia
University of Washington .... Washington
University of West Florida .... Florida
University of Wisconsin – Stout .... Wisconsin
Utica College .... New York
Valencia College .... Florida
Valley Forge Military College .... Pennsylvania
Virginia Commonwealth University .... Virginia
Virginia Polytechnic Institute & State University .... Virginia
Virginia Western Community College .... Virginia
Wake Technical Community College .... North Carolina
Walden University .... Minnesota
Walsh College .... Michigan
Washtenaw Community College .... Michigan
Waukesha County Technical College .... Wisconsin
Webster University .... Missouri
West Chester University of Pennsylvania .... Pennsylvania
West Virginia University .... West Virginia
Westchester Community College .... New York
Whatcom Community College .... Washington
Wichita State University .... Kansas
Wilmington University .... Delaware
Worcester Polytechnic Institute .... Massachusetts
Wright State University .... Ohio

AIR FORCE INSTITUTE OF TECHNOLOGY

AFIT Campus

Air Force Institute of Technology has a long and well-recognized history of providing cutting-edge, cyber-focused graduate education and research. Its education programs address both defensive and offensive operations, as well as acquisition and sustainment issues. AFIT awards an average of 32 cyber-related MS degrees and three PhD degrees annually; approximately half are MS of Cyber Operations and the remaining are Computer Science, Computer Engineering, and Electrical Engineering.

AFIT's Center for Cyberspace Research was established in March 2002 and conducts cyber operations research at the Master's and PhD levels. Research objectives are closely aligned with evolving and anticipated Air Force and Defense Department needs, with current lines of effort in human factors in cyber operations, multi-domain operations, software

defined networking, physical layer security, cyber physical and embedded systems, and cyber resilience in weapon systems.

AFIT collaborates actively with other DoD and Federal government organizations, civilian universities, and industry. AFIT is a co-founder of the Cincinnati- Dayton Cyber Corridor (Cin-Day Cyber), whose long-term goals include advancing cybersecurity education (to include growing the number of CAE schools), promoting research collaboration among higher education schools, establishing government and industry (employer) partnerships, and developing the regional workforce.

DESIGNATIONS

• CAE - Cyber Defense Research

CONTACT INFORMATION

Center for Cyberspace Research
(937) 255-3636 ext. 4690
ccrworkflow@afit.edu

www.afit.edu

AFIT students listen as Barry Mullins, AFIT computer engineering professor, clarifies how a technique works during their Cyber Attack class at WPAFB, OH
(U.S. Air Force Photo by Al Bright/Released)

AMERICAN PUBLIC UNIVERSITY SYSTEM

APUS Campus

Founded in 1991 as American Military University to serve the needs of a highly-mobile military, we are committed to serving our students and the broader community. Today, as **American Public University System (APUS),** we serve more than 80,000 adult learners worldwide and offer more than 200 degree and certificate programs -- in cybersecurity and other specialized fields such as intelligence studies, the latter up to the doctoral level -- that prepare our students for leadership and service in a diverse, changing world.

APUS was the first 100% online institution to be recognized by the Online Learning Consortium for Best Practices in Online Education. In 2018 alone, our faculty published more than 700 contributions to their disciplines and received more than 250 awards for their scholarship and instruction. More than 60% hold a terminal degree, and currently hold leadership positions with major companies and government agencies. In addition, since 2012, 43 APUS students have been finalists in the Presidential Management Fellows program and, in 2018, we celebrated a record class of more than 11,000 graduates—the true measure of our success.

We strive to expand access to a quality higher education by keeping our programs affordable and leading-edge. APUS's online bachelor's programs have been recognized for quality and affordability by U.S. News & World Report and Washington Monthly, respectively. APUS is also building an advanced learning platform by investing in game-based learning and simulation to strengthen student engagement and learning outcomes.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Kenneth L Williams
(571) 477-0105
Cyber@APUS.EDU

apus.edu/academic-community/cyber-defense

ANNE ARUNDEL COMMUNITY COLLEGE

AACC Cybersecurity Student

Anne Arundel Community College (AACC) was one of the first community colleges designated as a National Center of Academic Excellence in Cyber Defense Two-Year Education by the NSA and the U.S. Department of Homeland Security. AACC was also the first institution in the nation to be designated a National Center of Digital Forensics Academic Excellence (CDFAE) by the Defense Cyber Crime Center. CDFAE is the academic component of a partnership with government to create standards and best practices for digital forensics practitioners, educators, and researchers.

AACC offers Associate of Applied Science (A.A.S.) degrees and certificates in Information Assurance and Cybersecurity. These programs allow students to Implement real-world tools and scenarios to prepare for a career in Cybersecurity, Networking, and Digital Forensics. Students have access to the latest hardware and software necessary to provide comprehensive hands-on training. This experience enables individuals to gain the required knowledge and skills to be successful in cybersecurity related fields. Training includes, but is not limited to, the following technical areas of study:

• Networking
• Windows and Linux Server Administration
• Digital and Network Forensics
• Advanced Network Defense
• Network Intrusion Detection/Penetration Testing
• Ethical Hacking

The state of Maryland refers to the A.A.S. as a career degree, because it's intended to provide you with skills to enter the workforce. In some cases, AACC also has developed articulation agreements allowing students to transfer to select colleges.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Mary Wallingsford
(410) 777-7173
mewallingsford@aacc.edu

www.aacc.edu

AACC professor helping students

ARAPAHOE COMMUNITY COLLEGE

Littleton Campus

Parker Campus

Castle Rock Campus

Arapahoe Community College (ACC) is one of thirteen colleges in the Colorado Community College System (CCCS) with a service area covering the south metropolitan area of Denver, CO and primarily Arapahoe and Douglas Counties. The total population in ACC's service area is over 1 million and is located in one of the fastest growing regions in the US. The south metro area of Denver is home to many global business headquarters and offices. ACC enrolls 10,000 students annually in three locations located in Littleton (main campus), Parker, and Castle Rock. ACC opened the new $40 million dollar Sturm Collaboration Campus in partnership with Colorado State University, the Douglas County School District, the town of Castle Rock, and local industry partners.

In March 2019, ACC received a private gift of up to $10 million from the Sturm Family Foundation, the largest in the history of the 13-institution Colorado Community College System. Approximately half of the Sturm's gift was immediately invested in several areas, including program and staffing startup and state-of-the-art equipment and software that went to directly benefit the technology pathway programs in cybersecurity and secure software development.

ACC offers more than 90 certificate, degree, and transfer programs with seven core pathways including, Arts, Communication, and Design; Business; Global, Human, and Social Studies; Health; Math and Sciences; Public Services; Technology

ACC received designation as a CAE in Cyber Defense Education at the associate level for its Associate in Applied Science in Computer Network Technology/Network Security concentration in 2019.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Nina Amey
(303) 797-5252
nina.amey@arapahoe.edu

arapahoe.edu/academics-programs/resources/academic-experiences/cyber-center

Sturm Collaboration Campus Cyber Center

Augusta Technical College Campus

Augusta Technical College is the first two-year Technical College System of Georgia (TCSG) institution to hold the National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE2Y) designation. The College has a long-standing tradition and successful history of producing quality IT graduates. Along with Cybersecurity, we also offer degrees in Computer Programming, Networking Specialist, and Computer Support, as well as specialized Technical Certificates of Credit and numerous industry related certifications.

The Computer Programming Specialist program has been producing well-trained and competent programmers for over 30 years. During the same time period, the Computer Support Specialist program has been producing graduates fully prepared to fulfill multiple occupational roles in support of current computing infrastructure trends to include data center operations, virtual machine computing, and cloud service technologies.

The Networking Specialist program, which was the first in the Technical College System of Georgia (TCSG), was started over 20 years ago. This program has adopted new and emerging networking technologies to meet the needs of local and state industry. Augusta Technical College was designated a Cisco Networking Academy over 20 years ago, as well as a Microsoft IT Academy for 14 years. The networking classes have always had a strong emphasis on security practices. The program has been taught in a performance-based environment with the occupational goal of preparing students to be workforce-ready and able to pass industry certifications during and upon completion of their programs.

DESIGNATIONS

• CAE–Cyber Defense 2-Year Education

CONTACT INFORMATION

Jim Poarch
(706) 771-4136
jpoarch@augustatech.edu

www.augustatech.edu

Georgia Cyber Center, Hull McNight Building

AUGUSTA UNIVERSITY

Georgia Cyber Center; Home of the School of Computer and Cyber Sciences

Augusta University achieved Center of Academic Excellence in Cyber Defense Education designation in 2016. Our University has a long, rich history in computing education, awarding baccalaureate degrees in computer science and information technology since the 1970s.

The Augusta University School of Computer and Cyber Sciences conducts research and offers academic programs in computer science, information technology, cybersecurity, and the outreach and engagement activities of the Cyber Institute.

The Augusta University School of Computer and Cyber Sciences offers five undergraduate Bachelors of Science degrees: Computer Science, Cyber Operations, Information Technology, Cybersecurity, and Cybersecurity Engineering. We also offer a professional Master of Science degree in Information Security Management. We will offer a research-based Master of Science in Computer Science program beginning in August 2020 and are also creating a research-based Doctor of Philosophy (PhD) program in Computer Science.

The Cyber Institute supports and champions meaningful, innovative, and interdisciplinary cybersecurity outreach and engagement with a focus on collaborative partnerships with K-12 education, healthcare, government, and business. The Cyber Institute engages in community outreach activities, including annual GenCyber summer camps for high school juniors and seniors and a Girls Who Code club for 6th – 12th grade girls.

Since 2017, 13 Augusta University students have received Department of Defense Cyber Scholarship Program (CySP) Recruitment and Retention scholarships. To date, Augusta University students successfully competed for these prestigious CySP scholarships, receiving $1.1 million in funding.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Steven G. Weldon
(706) 729-2776
sweldon@augusta.edu

www.augusta.edu/ccs
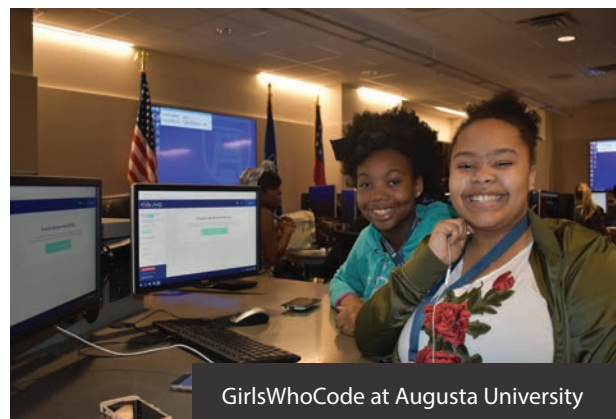
GirlsWhoCode at Augusta University

BAKER COLLEGE

Baker College, Owosso Campus

Baker College received the designation of CAE-CDE in July 2019. The BS Information Technology and Security with concentration in Information Assurance and Cyber Security program provides a solid foundation in security across different systems and platforms. The program is constantly updated and is supported by cybersecurity professionals with experience in the field. In addition to the theoretical foundation, students acquire hands-on skills in well-equipped laboratories and by participating in the Cyber Defense club activities.

Baker College has a very rich tradition within the Cyber Defense community. Since 2008, our teams have won numerous Collegiate Cyber Defense Competitions (CCDC) including two National Championships, two Midwest Championships, and eight State of Michigan Championships.

The Center for Cyber Security at Baker College provides the education, experience and resources essential to cultivate effective leaders in today's digitally dependent world. The Center combines the College's strengths in software management, cybersecurity, information assurance, and computer expertise to develop cyber security professionals who are guided by logic, critical thinking and ethics. Its goals are to:

- Advance the cybersecurity capabilities of the workforce within the Baker College's service region as well as nationally.
- Increase the number of highly educated, digitally literate citizens within underrepresented people and veterans and produce professional specialists in areas of critical need from among those groups.
- Generate educational, outreach and research activities that will ensure the protection of the critical infrastructure of the United States as a whole.
- Allow Baker College's graduates to specialize in cyber security and intelligence analysis.

DESIGNATIONS

- **CAE – Cyber Defense Education**

CONTACT INFORMATION

Doug Witten
(810) 766-4110
doug.witten@baker.edu

www.baker.edu

2020 Michigan CCDC 1st Place Baker College Team
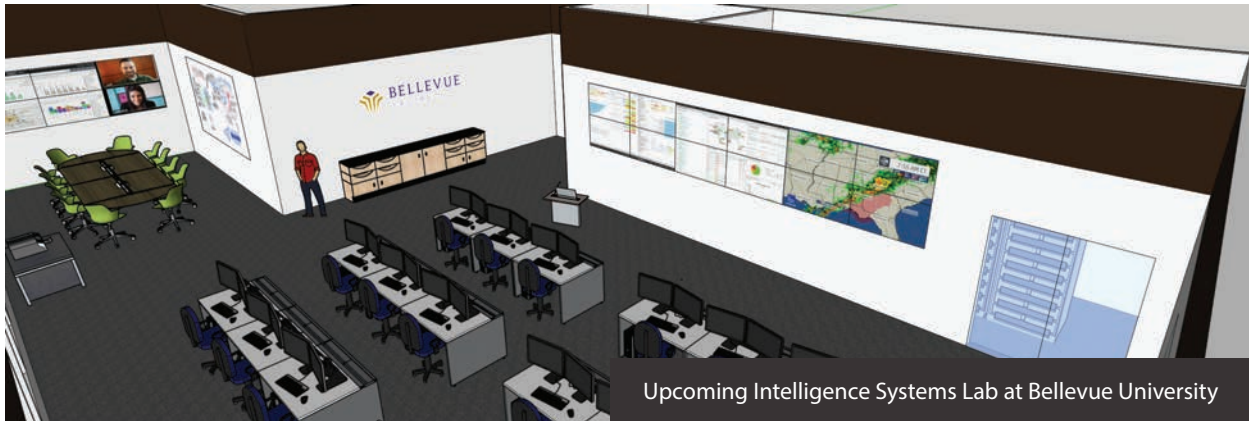
Upcoming Intelligence Systems Lab at Bellevue University

Bellevue University, a non-profit university with more than 50,000 graduates, is one of the nation's leaders in preparing students for lifelong career success. Routinely ranked among the nation's top-military friendly and accessible institutions, Bellevue University offers innovative education programs that produce professionals who are well-trained and have full mastery of the skills needed to protect our nation's infrastructure.

With more than 80 degrees offered through online and on campus programs, including a Bachelor and Master of Science in Cybersecurity, a Graduate Cybersecurity Certificate, and several programs offering a cybersecurity emphasis, Bellevue University stands at the forefront of applied cybersecurity education. Through its Center for Cybersecurity Education, the University offers a range of interdisciplinary degrees that bring together information assurance, business, systems and network administration, security management, and more.

A team of qualified, passionate faculty with extensive experience in professional environments ranging from U.S. military to Fortune 500 organizations to technology start-ups, helps ensure students are prepared to tackle real life challenges across the information technology spectrum. The new C&A Industries Intelligence Systems Lab on Bellevue University's Nebraska campus leverages the common technical ground that exists among the fields of cybersecurity, systems and network administration, and data science. Starting in 2019, the lab will serve as a state-of-the-art venue to train security operations and provide students with the opportunity to learn and practice skills in a virtualized environment using a suite of open-source and commercial tools.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Mary Dobransky
(402) 557-7160
dobransky@bellevue.edu

www.bellevue.edu

Bellevue University Campus

Bismarck State College Campus

BISMARCK STATE COLLEGE

Bismarck State College (BSC) is an innovative community college overlooking the banks of the Missouri River in Bismarck, North Dakota. BSC is the third largest institute of higher education in the North Dakota University System, offering high quality education, workforce training, and enrichment programs to local and global communities.

BSC is proud to be a CAE-CDE with its Associate in Applied Science in Cybersecurity and Computer Networks degree. BSC cybersecurity faculty strives to give hands-on experiences and teach highly marketable technical skills to students, providing the knowledge to meet the ever-changing technologies used in business and industry. Graduates are prepared to install operating systems, configure networks, manage servers, and perform other system administration tasks while maintaining fundamental security practices.

In 2018, BSC became the first polytechnic institution in North Dakota. During the same year, BSC partnered with Palo Alto Networks, a global cybersecurity leader, enabling BSC to scale online and classroom cybersecurity offerings, including the addition of a Bachelor of Applied Science in Cybersecurity and Information Technology degree. Graduates are prepared to secure network communications, configure virtualization, manage cloud-based resources, and perform other security-related tasks while implementing information technology.

BSC is a higher education leader for the K-20W cyber education initiative in North Dakota, a collaborative effort with public and private sector partners committed to providing resources and training to teachers, administrators, and students from kindergarten to the workforce. Through BSC's state-of-the-art programs and partnerships, it is committed to providing high level cybersecurity training and awareness.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Matthew Frohlich
(701) 224-5581
matthew.frohlich@bismarckstate.edu

bismarckstate.edu/cybersecurity

BSC Students Administering Cybersecurity Solutions

BLOOMSBURG UNIVERSITY OF PENNSYLVANIA

Bloomsburg University Campus

Bloomsburg University (BU) offers the only digital forensics bachelor's degree in the Pennsylvania State System of Higher Education and is Pennsylvania's Center for Digital Forensics. It is one of the top digital forensics and cybersecurity programs in the country. Classrooms and labs have professional digital forensics software and hardware installed. Courses cover all aspects of digital forensics and security. The unique virtual environment for the Bloomsburg University's digital forensics curriculum provides access for the students to conduct a wide variety of labs by having dedicated servers to host virtual machines for the students. Every course includes hands-on labs.

Bloomsburg University considers participation in cyber defense and forensics competitions an important part of student development. The University supports clubs dedicated to cyber defense and digital forensics and hosts its own security conference, BloomCon, each year. BloomCon features an excellent mix of industry speakers and competitions for students and attendees. The conference includes competitions such as wireless network hacking, a lockpick village, and drone wars.

Bloomsburg University has excellent and well-known faculty members dedicated to teaching courses in this field of study. They come with practical experience and deep knowledge in digital forensics, criminal investigations, network security and forensics, system security, and penetration testing. Bloomsburg University Digital Forensics graduates have an extremely high placement rate. They work in law enforcement, government agencies, and the corporate world. Bloomsburg University accepts credits from over 1000 institutions.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Diane Barrett
570-389-4500
Dbarrett@bloomu.edu

intranet.bloomu.edu/digital-forensics-cias

A Bloomsburg Digital Forensic Lab

BOSSIER PARISH COMMUNITY COLLEGE

Bossier Parish Campus

Bossier Parish Community College (BPCC) is a leader in hands-on information technology education that results in students successfully entering the IT workforce upon graduation. BPCC's responsiveness to industry partners' needs has allowed BPCC to stay at the cutting edge of curriculum updates, new technologies, and the latest tools being used in the IT field. BPCC offers multiple degree options, allowing students to graduate in one semester, one year, or two years depending on the career track. Job opportunities include working as a network technician, security analyst, programmer/software developer, systems administrator, IT help desk technician, or computer repair technician.

BPCC is proud to hold multiple statewide and national cyber designations. Recently, BPCC was designated as Louisiana's Cyber Education Center of Excellence in partnership with Cybint Solutions. Through this designation, BPCC will serve as the hub for cybersecurity training in North Louisiana which will provide a comprehensive platform with simulated labs in a cyber-range environment for our students and industry partners. BPCC is also a National Center of Academic Excellence in Cyber Defense Education as well as a Center of Workforce Excellence in Cyber Technology from the Louisiana Community and Technical College System Board of Supervisors and the Board of Regents.

In 2019, BPCC hosted the national 3CS (Community College Cyber Summit), allowing us the opportunity to showcase our region, school, and programs. This further served to demonstrate our desire to lead the way in cybersecurity training in the state of Louisiana and provide training for the cyber workforce of tomorrow.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Chris Rondeau
(318) 678-6317
crondeau@bpcc.edu

www.bpcc.edu

Student working on labs

BOSTON UNIVERSITY
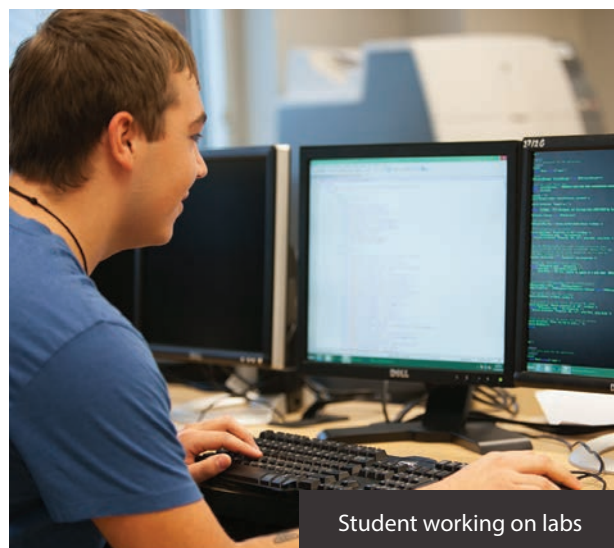
Boston University Campus

The mission of the **Center for Reliable Information Systems and Cyber Security (RISCS) at Boston University (BU)** is to promote and coordinate research and education in trustworthy, safe, and secure systems and networks by emphasizing a multidisciplinary approach that includes fields as diverse as reliable and secure computations, data science, engineering, economics, ethics, and law. Through RISCS, BU has been recognized as a Center of Academic Excellence in Cyber Defense since 2004 and in Cyber Defense Research since 2008.

The Center draws on the expertise of 22 faculty and over 100 graduate students from the College of Arts and Sciences, the College of Engineering, Questrom School of Business, and Metropolitan College, and provides opportunities for faculty and students from diverse fields to collaborate on interdisciplinary research problems, create new knowledge, and develop innovative multidisciplinary curricula. Current research areas include cryptography, modular approaches to cloud security, data privacy, differential privacy, data science approaches to security, secure multi-party analytics, network and software security, software safety, trustworthy computing, database security, among others.

BU has a comprehensive educational portfolio that ranges from robust undergraduate course offerings to master's programs with cybersecurity specializations in computer science, computer information systems, and engineering and PhD programs in fundamental and applied research. Flexible learning options—online, hybrid, and evening—are available through Metropolitan College. BU's fully online programs in information technology, including the cybersecurity concentration, have been ranked in the top ten online programs for the last five years.

DESIGNATIONS

- **CAE – Cyber Defense Education**
- **CAE – Cyber Defense Research**

CONTACT INFORMATION

Tanya Zlateva, Ph.D.
(617) 353-2568
zlateva@bu.edu

bu.edu/riscs

BU Cyber Students

Bowie State University Campus

BOWIE STATE UNIVERSITY

The **Center for Cyber Security and Emerging Technologies (C2ET)** at **Bowie State University** provides educational, research, and training opportunities in network and information security to both students and faculty. C2ET embodies the joint efforts of the Department of Computer Science, Department of Technology and Security, and the Department of Management Information Systems. C2ET core objectives and purpose include:

- Providing undergraduate and graduate education, as well as training in information assurance in improving the protection of information resources.
- Conducting basic and applied research to enhance the security of information resources.
- Coordinating campus wide educational, research, outreach, and policy activities related to information assurance.

- Consolidating access to information on academic programs and research in the discipline of information assurance/security.
- Providing information and guidance to government, industry, non-profit organizations, and individuals who are attempting to solve information security problems.
- Serving as the primary BSU interface with the U.S. National Security Agency and the Department of Homeland Security regarding education and training in cybersecurity and requirements and obligations regarding the university's designation as a Center of Academic Excellence in Cyber Defense Education.

The Department of Computer Science offers a Bachelor of Science degree with a specialization in Cybersecurity. The Department of Technology and Security offers a Bachelor of Science degree in Computer Technology with a track in Computer and Network Security. The Department of Management Information Systems offers a Master of Science in Management Information Systems with a concentration in Information Assurance.

DESIGNATIONS

- **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Rosemary Shumba
(301) 860-3960
rshumba@bowiestate.edu

cs.bowiestate.edu/cnis/index.html

BSU Cyber Squad

BYU
BRIGHAM YOUNG
UNIVERSITY
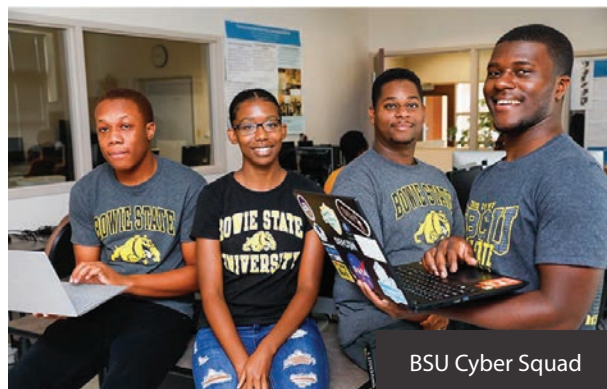
BYU Campus

Brigham Young University (BYU) became the first CAE in Utah in 2012. Initially, the program was tied to a cybersecurity emphasis within the Information Technology undergraduate program. Due to a continued surge in interest among faculty and students, a new cybersecurity major started in Fall of 2018.

Additionally, many Master's in Technology students focus on cybersecurity in their classes and required thesis. BYU students are uniquely qualified to serve important cybersecurity needs. BYU focuses on building men and women of character who act ethically in the service of others. BYU has over 30,000 motivated undergraduate students (avg. high school GPA: 3.86; avg. ACT: 29.5) from all 50 states and over 100 countries. Over 65% speak a second language (126 languages are spoken on campus) and nearly 50% have lived outside the U.S.

The cybersecurity major's CAE-CD designation was renewed in 2017 in Systems Security Administration, Digital Forensics, and Network Security Administration. Students have won numerous regional and international Collegiate Cyber Defense Competition (CCDC) competitions and came in 2nd and 3rd at Nationals (2016 and 2017). Graduates now work at Microsoft, Symantec, Raytheon, Bishop Fox, Adobe, the United States Air Force, Sandia National Labs, Idaho National Labs, and other leading institutions. Students in the Cybersecurity Research Lab participate in research and a student Red Team. They help attract female students through the annual Girls Cybersecurity Summer Camp.

Strong support from the College of Engineering and BYU leadership promises a bright and growing future for cybersecurity at BYU in coming years.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Justin Giboney
(801) 422-6307
justin_giboney@byu.edu

it.et.byu.edu
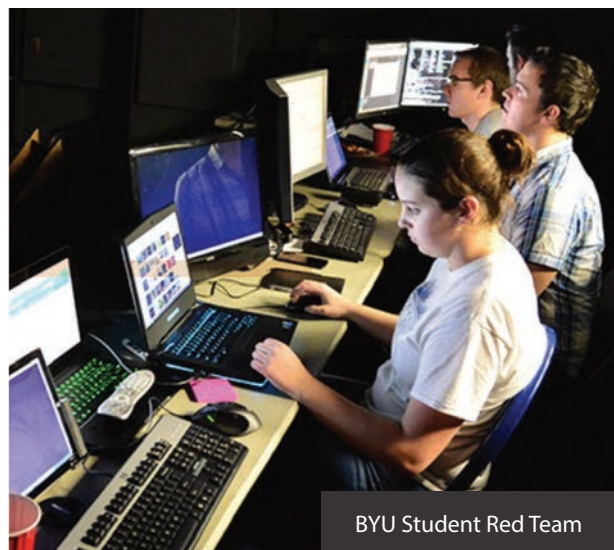
BYU Student Red Team

BROOKDALE COMMUNITY COLLEGE

Brookdale Community College Campus

Brookdale Community College, located in Lincroft, New Jersey, is an excellent resource for residents of Monmouth County, offering two-year associate degrees and certificates, plus non-credit classes in many areas of personal and professional interest. Brookdale was first designated as a Center of Academic Excellence in Cyber Defense in 2019 and has maintained the designation while growing in the cyber education field both statewide and nationally. Cyber defense is a major focus in the New Jersey/New York Metro area due to proximity of industries focused on banking and finance, defense contracting, and healthcare. The college offers classes in traditional and online formats to serve our diverse student population.

In 2019, Brookdale was one of seven community colleges awarded Scholarship for Service grants as part of a pilot program for community colleges to train students in cyber defense. A Department of Education grant for the improvement of postsecondary education enabled the college to build a virtual lab environment in the college's data center, giving students free 24/7 access to a robust, sandboxed learning environment. An NSF-funded project focused on engaging students with interactive learning has built a library of free cybersecurity interactives that aid students in mastering difficult concepts. We have developed multiple partnerships, including Palo Alto Networks, Red Hat, Microsoft, Network Development Group, CompTIA, and Cisco.

Graduates may continue their education at one of our partner universities or enter the local workforce. The CAE-CD designation adds credibility to our program, has been a boon to marketing, recruitment, and additional grant opportunities.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Michael Qaissaunee
(732) 224-2879
mqaissaunee@brookdalecc.edu

brookdalecc.edu/stem-institute

Cyber Aces at BCC

BUTLER COMMUNITY COLLEGE

Butler Community College Student Union

Butler Community College's Cyber Security program is designated a National Center of Academic Excellence in Cyber Defense Education by the National Security Agency and the Department of Homeland Security.

Established in 1927 and located in Kansas, Butler has recently celebrated its 90th year in higher education. With a proud tradition in academics, athletics and service to the communities it serves, Butler touches the lives of more than 13,000 students annually. At Butler, we take our cybersecurity curriculum very seriously and we view cyber security threats as opportunities – learning opportunities. Butler offers pathways that prepare students for entry into the workforce or for transfer to a four-year university program.

In the classroom, students learn from experienced professionals what it truly takes to maintain IT security. Whether students choose a one-year certificate or two-year degree, all completers hold certifications in TestOut PC Pro, Network Pro, Security Pro, Client Pro, and Server Pro and are prepared to sit for certification in CompTIA A+, Network+, Security+, and Microsoft MSCA.

Students learn first-hand how to secure networks and infrastructures against cyber attacks in a rigorous curriculum that produces graduates with the necessary expertise to reduce vulnerabilities within information infrastructures. Students can create secure network environments using risk and threat analysis, network monitoring, host hardening as well as many other network defense mechanisms. Butler's cyber security graduates are well-positioned for success in an industry expected to grow by 28% in the next decade.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Kevin Lann-Teubner
(316) 218-6156
klannteubner@butlercc.edu

butlercc.edu/cyber-security
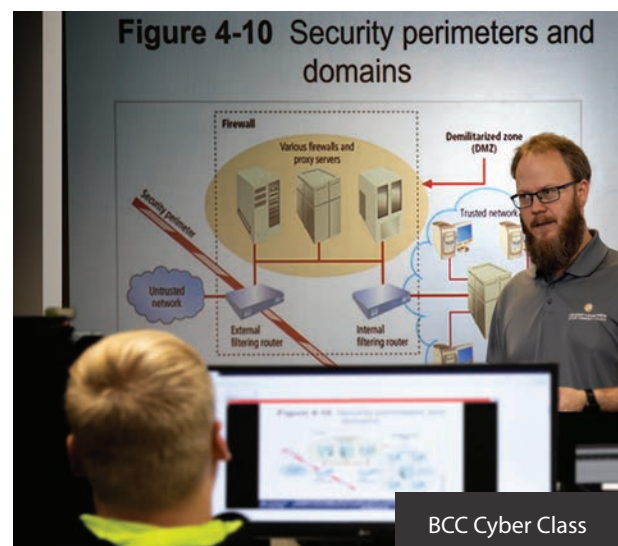
BCC Cyber Class

CALHOUN COMMUNITY COLLEGE

Mathematics, Science, & CIS Building, Huntsville Research Park Campus

The largest of Alabama's two-year community colleges, **Calhoun Community College** is an open-admission, community-based, state-supported, coeducational, comprehensive community college dedicated to providing affordable, high-quality and accessible education to individuals in its four-county service area.

Established in 1947, Calhoun offers a full array of university transfer and career training programs. Academic programs are aligned with those of Alabama's state universities through the STARS program and provide students with a seamless path toward a baccalaureate degree. Technical degrees are designed to serve the area's manufacturing base and include participation in the Alabama FAME (Federation for Advanced Manufacturing Education) Advanced Manufacturing Technician program.

The Huntsville campus is situated in Cummings Research Park (the nation's second largest research park), in view of the US Space and Rocket Center and near Redstone Arsenal, home to NASA's Marshall Space Flight Center and the Army Aviation and Missile Research Development and Engineering Center (AMRDEC). With a mission that includes support for local economic development, Calhoun was an early leader in building ties to Huntsville's cybersecurity community, and its Computer Information Systems (CIS) department introduced its initial cybersecurity coursework in 2010. It has since developed a cybersecurity degree program and received CAE-2Y recognition in 2018. Calhoun's CIS department also offers degrees in programming and networking, with coursework leading to industry- recognized certifications. Calhoun's **Center for Cybersecurity Education (CCE)** provides information assurance and cyber defense education along with community outreach to promote best practices within and outside our campus to prepare the next generation of cybersecurity professionals.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Andrew Gregory
(256) 890-4987
andrew.gregory@calhoun.edu

calhoun.edu/center-for-cybersecurity-education

Calhoun IT students in the server lab, Decatur Campus

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

CPP Student Services Building

Cal Poly Pomona (CPP) is among the best public universities in the West and is nationally ranked for helping students achieve economic success. As an inclusive polytechnic university, we cultivate success through experiential learning, discovery, and innovation. Our graduates are ready to succeed in the professional world on day one. Faculty in all disciplines put theory to practice, providing students with opportunities to apply their knowledge in hands-on projects, research collaborations, and valuable internship and service-learning programs.

Since its initial designation as a National Center of Academic Excellence in 2004, the California Center for Cyber Risk (formerly the Center for Information Assurance) has been a leader in cybersecurity education, earning the respect of government officials, industry leaders, and national news media. The university has become a top destination for recruiters seeking talented cybersecurity graduates.

CPP recently launched a Cyber Security Instructional Research Project (CSIRP) promoting innovative teaching, research, and collaboration. The CSIRP currently operates the following services:

- Security Operations Center
- Malware Analysis Center
- Collaborative research space for faculty and shared spaces for students
- Student-run hybrid-cloud computing, storage and lab infrastructure
- A High Performance Computing environment supporting teaching and research
- An Internet of Things research facility

The first project housed by CSIRP is a student-run security operations center and malware analysis lab funded by Northrop Grumman and led jointly by computer information systems Professor Ron Pike and computer science Professor Mohammad Husain. The cross-disciplinary project involves students from multiple disciplines conducting research, developing skills for the workforce, and training fellow students.

DESIGNATIONS

- **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Srikanth Venkatesan
(909) 869-2629
svenkatesan@cpp.edu

cpp.edu/cba/information-assurance

Student Security Operations Center

Students at CSUS

The **Department of Computer Science of College of Engineering and Computer Science (ECS)** at California State University, Sacramento (Sacramento State) established a **Center for Information Assurance and Security (CIAS)** in 2005. The mission of the center is to advance knowledge of information assurance and security practices through:

- Education, training, and awareness programs in information assurance and security issues and practices
- Applied research in information assurance and security
- Developing interdisciplinary programs in information assurance and security
- Outreach to assist our community, including community colleges, K-12 schools, industry, and government in information assurance and security issues
- Forming collaborations with other education, research, industry, and government institutions

CIAS has been designated as a National Center of Academic Excellence (CAE) in Information Assurance Education (CAE-IA) since 2007. This designation is jointly sponsored by the National Security Agency (NSA) and Department of Homeland Security (DHS). The designation has to be renewed every five years to ensure the designated institution meets stringent criteria with respect to curriculum, faculty, research, and institution-wide commitment to information assurance practices and education. CIAS has recently been awarded its re-designation as a **CAE in Cyber Defense (CAE-CD)** for the academic years 2017-2022. The CAE designation was one of the key factors for the National Science Foundation (NSF) to award Sacramento State over $4 million in funding as part of the **CyberCorps® Scholarship for Service (SFS)** program to support students in computer science or computer engineering to become cybersecurity specialists for the academic years 2010-2020.

DESIGNATIONS

- **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Jun Dai
(916) 278-5163
jun.dai@csus.edu

ecs.csus.edu/wcm/cias

Profs. Behnam Arad and Jun Dai with Student in SFS Lab

CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO

CSUSB cybersecurity students mentoring high school students during open house.

The **Cybersecurity Center (CSC)** at **California State University, San Bernardino (CSUSB)** is a pioneer in cybersecurity education. As one of four National Resource Centers designated by the National Security Agency, the Cybersecurity Center became a Center of Academic Excellence in Information Assurance by the National Security Agency (NSA) and the Department of Homeland Security (DHS) in 2008. As a reflection of our excellence, CSUSB received our designation as a Center of Academic Excellence in Cyber Defense Education through 2021, recognized for our specialty areas in Cyber Investigations and Network Security Administration.

Home to the nationally acclaimed NICE Challenge Project, and host to one of the top CyberCorps®: Scholarship for Service (SFS) programs in the nation, the Center continues to push the boundaries and possibilities of cyber education. The CSC recently became the lead institution for the nationally renowned INSuRE program, sponsored by the NSA and is a co-lead with Whatcom Community College on the launch of the Community College Cybersecurity Pilot (C3P) program, sponsored by the National Science Foundation (NSF) and modeled off our own SFS program.

Annually, the CSC participates in several local, regional, and national events that boost the profile of CSUSB and our over 600 talented students. The Cyber Intelligence and Security Organization (CISO) club at CSUSB won three out of four first-place prizes at the Information Technology Competition and actively hosts over ten student projects.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Tony Coulson
(909) 537-7535
tcoulson@csusb.edu

cyber.csusb.edu

GenCyber at CSUSB

CSUSM Campus

The Master of Science in Cybersecurity: A Professional Science Master's degree at **California State University San Marcos (CSUSM)**, is a fully online program that uniquely combines technical courses, MBA-level business courses, and real-world experience. Our students prepare for advancement in the cyber industry by gaining experience in areas such as security management, risk analysis, network protocols, incident response, encryption algorithms, ethical hacking, and intrusion detection. CSUSM was designated a National Center of Academic Excellence in Cyber Defense Education in 2019.

Responding to demand from industry, the CSUSM cybersecurity master's program develops graduates knowledgeable in both cybersecurity and related business skills. This interdisciplinary program combines advanced study of related technical science, professional preparation, and business fundamentals, requires 38 semester hours of coursework, and culminates with a project with an industry partner.

Nationally, there is increased focus on graduate degree programs that combine both technical and management skills. This trend is reflected in the emergence of the Professional Science Masters (PSM), which adeptly addresses the documented need for management-trained professionals "for technology-based companies, governmental agencies, and non-profit organizations." (NPSMA.org)

CSUSM's Cybersecurity PSM differs from a traditional master's degree in the sciences as it is interdisciplinary and emphasizes the development of critical thinking using current case studies to expose students to real-world scenarios. The program also introduces students to the cybersecurity corporate world, developing the technical, ethical, and problem-solving skills needed to address cybersecurity issues in industry settings, positioning graduates to become the next generation of industry leaders.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Teresa Macklin
ms-cybersecurity@csusm.edu
(760) 750-4787

csusm.edu/el/cyber

CSUSM Cyber Program

CAPITOL TECHNOLOGY UNIVERSITY

Capitol Technology University Campus

Capitol Technology University continues to define what it means to be a leader in high-demand technology fields, enabling students to learn, build, and succeed in a practical, hands-on environment. With a commitment to positioning students for jobs immediately upon graduation, Capitol has proven outcomes that attract a high caliber of students, faculty, and community partners.

The university's 52-acre campus, located in Laurel, Maryland, is centered in one of America's most vibrant technology corridors, between Baltimore, MD and Washington, DC.

Cybersecurity programs at Capitol blend scientific theory and application, further strengthened by the university's state-of-the-art labs, including the Center for Cybersecurity Research and Analysis. The Center serves as a learning hub, where individuals – both students and professionals – can engage in exchange.

From the student-made video game console, to an array of labs in additional key technology areas, a culture of innovation is ingrained into the Capitol experience. Both online and in-class program options are available to enable undergraduate and graduate students to earn a degree on their terms.

As one of the first schools to be designated a National Center of Academic Excellence in Cyber Defense, Capitol stands ready to advance the field and do its part to combat one of the nation's greatest challenges one student at a time.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

William H. Butler, D.Sc.
(240) 965-2458
whbutler@captechu.edu

Capitol Student Working in Lab

CARNEGIE MELLON UNIVERSITY

CMU Campus

A private, global research university, **Carnegie Mellon University (CMU)** stands among the world's most renowned educational institutions and sets its own course. The Information Networking Institute (INI) at CMU educates and develops engineers through technical, interdisciplinary master's degree programs in information networking, security, and mobility that incorporate business and policy perspectives. With extraordinary agility, the INI has navigated the changing landscape of technology from wired communications in the 1980s to wireless, mobile, and the Internet of Things in today's world.

CMU is a longstanding leader in cybersecurity education and research. The university invested heavily in hiring cybersecurity faculty prior to 9/11, and later launched CyLab, the university-wide institute that brings together over 300 researchers in security and privacy. In 2003, the INI established one of the nation's first security degrees, the Master of Science in Information Security (MSIS, formerly the M.S. in Information Security Technology and Management) and has since graduated 378 students well-positioned to defend our nation and tackle the challenges faced by government agencies.

Through the INI and CyLab, CMU has attained all three CAE designations - Cyber Defense Education, Cyber Defense Research, and Cyber Operations.

Carnegie Mellon participates in scholarship programs designed to increase and strengthen the cache of cybersecurity professionals that protect the Nation's critical infrastructures and national defense. Since 2001, CMU has graduated 219 students through the National Science Foundation (NSF) CyberCorps®: Scholarship for Service (SFS) and seven students through the Department of Defense Cyber Scholarship Program (CySP).

CMU also participates in the multi-university INSuRE (Information Security Research and Education) program, which engages students in active research projects under the guidance of government organizations and research labs.

DESIGNATIONS

- **CAE - Cyber Defense Education**
- **CAE - Cyber Defense Research**
- **CAE - Cyber Operations**

CONTACT INFORMATION

Dr. Dena Haritos Tsamitis
(412) 268-3297
dena@cmu.edu

cmu.edu/ini

CMU INI Conference

Cedarville University

Cedarville University Campus

The National Security Agency (NSA) named **Cedarville University** a National Center of Academic Excellence in Cyber Operations in 2018. In 2019, Cedarville's cybersecurity program was awarded the prestigious Accreditation Board for Engineering and Technology (ABET) cybersecurity accreditation. Cedarville offers a Bachelor of Science in Cyber Operations, a Bachelor of Science in Computer Science with a Cyber Operations specialization, and a Master of Business Administration with a Cybersecurity Management concentration.

Cedarville's Cyber Operations is interdisciplinary, with both technical and nontechnical courses. In the majority of their courses, students learn highly specialized skills required to perform cyber operations related to collection, exploitation, and response as well as security fundamentals, cryptography, and secure software development.

Students also study public policy, business, ethics, and law as they relate to cybersecurity.

Cedarville is a private faith-based teaching college with a special focus on the traditional undergraduate experience. All undergraduates earn a Bible minor as part of their general education coursework, attend campus chapel five days a week, and affirm the Cedarville Covenant, which states, "We will love God and others, live with integrity, and pursue excellence in all we do." The Wall Street Journal ranked Cedarville second in the nation for Student Engagement in 2019, recognizing the University's supportive environment.

Cedarville University houses the Center for the Advancement of Cybersecurity. Led by Seth Hamman, Ph.D., the Center seeks to advance cybersecurity in our nation by developing tomorrow's cyber leaders in the classroom, shaping cyber education in the academy, and promoting cyber awareness in society.

DESIGNATIONS

• **CAE - Cyber Operations**

CONTACT INFORMATION

Dr. Seth Hamman
(937) 766-7686
sethhamman@cedarville.edu

cedarville.edu\cybercenter

Cedarville CAE Program

CITY COLLEGE OF SAN FRANCISCO

CCSF Campus

City College of San Francisco (CCSF) has one of the strongest cybersecurity programs in California's community college system. Since the mid-2000s, the program has grown and flourished, led by industry-recognized faculty who take bold, unorthodox approaches to curriculum development and delivery. As a result, new students and degreed skill-builders fill the classes. The program offers a Computer Networking and Information Technology Applied Science degree in Network Security and two certificates, Cybersecurity and Advanced Cybersecurity. CCSF's cybersecurity curricula are designed to prepare students for industry certifications, such as CompTIA Security+, Certified Ethical Hacker (CEH), and Certified Information Systems Security Professional (CISSP).

In recent years, CCSF's cybersecurity competition teams have become formidable contenders in an arena some could consider out of their league; a two-year program competing against four-year universities such as Stanford and the University of California. CCSF, often one of just 1-3 community colleges in a field of 15-20 schools consistently places in the top three of the annual Western Regional Collegiate Cyber Defense Competition.

City College of San Francisco provides the related instruction for the state's first joint U.S. Department of Labor and California Department of Industrial Relations registered cybersecurity apprenticeship. Along with designation as a Center for Academic Excellence in Cyber Defense Education and our esteemed faculty, CCSF aims to continue preparing our students to meet the growing need for cyber talent.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Richard Taha
rtaha@ccsf.edu

ccsfcnit.info

CCSF 2019 Cyber Competition Team

Clark State, Springfield

Since its beginning in 2008, the Cybersecurity/ Information Assurance program at **Clark State Community College (CSCC)** has aimed to be a leader in cyber defense.

To further enhance this commitment, the Cybersecurity/Information Assurance program created the Center for Cyber Defense Education. The mission of this center is to provide high quality programs and courses that meet or exceed national academic standards and prepare Clark State graduates for the local cybersecurity workforce, including Wright Patterson Air Force base and many Department of Defense contractors. Additionally, the Center works with local businesses and members of the community to increase awareness of the significant threats currently faced by owners and operators of information systems and the public.

The Cybersecurity/Information Assurance (IA) Associate of Applied Science degree program prepares students to support the information security needs of businesses. Students can spend up to two semesters working in the information technology field while earning college credit.

In addition to designation as a CAE-CDE for the Cybersecurity/IA degree, CSCC has received three National Science Foundation Advanced Technological Education grants which have focused on developing and supporting the cybersecurity program and its faculty. The most recent grant focuses on developing hands-on learning labs specifically focused towards facilitating high school teachers who are interested in teaching foundational cybersecurity topics.

The program is managed by two full-time faculty members, Danis J. Heighton and Greg Teets who hold multiple certifications and have extensive experience as IT professionals from positions prior to their education tenures.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Danis Heighton
(937) 328.6116
heightond@clarkstate.edu

clarkstate.edu

CyberSecurity students and faculty

![CLEMSON UNIVERSITY]

The Duke Energy Electrical Grid Research Innovation and Development center (eGRID) at Clemson can simulate the electrical grid of any country in the world to test how cities would manage cyberattacks to power infrastructure

Clemson University continues to develop research infrastructure, educational programs, and faculty expertise in alignment with national security interests in cybersecurity.

With a focus on power systems security and on securing cyber-physical systems, Clemson takes a broad, multidisciplinary approach to cybersecurity research with at least 15 faculty from eight departments and Clemson Computing and Information Technology (CCIT) contributing. Clemson offers unique research equipment and facilities for research related to autonomous vehicles and systems connectivity, electrical grid simulation, cloud computing, social media listening, high-speed computing, and big data analytics. Clemson works closely with federal agencies and the private sector to pursue research projects with real-world impact. In the past five years, Clemson has secured $27 million

in grant awards for cybersecurity projects and Clemson faculty garnered more than 400 citations in 2017 alone for cybersecurity-related research.

Additionally, Clemson offers a broad range of cybersecurity courses at both the undergraduate and graduate levels, covering topics such as computer security principles, censorship, malware design, and penetration testing. Clemson aims to graduate more students to fill critical workforce needs in the cybersecurity sector and now offers a minor in cybersecurity for undergraduates with multiple paths for students in business, science, and engineering.

The mission of the new Clemson University Cybersecurity Center is to propel Clemson University as a leader in the field of cybersecurity in all aspects, including research, education, industry partnership, and community engagement.

DESIGNATIONS

- **CAE – Cyber Defense Research**
- **CAE – Cyber Defense Education**

CONTACT INFORMATION

Harlan Russell
(864) 656-7214
harlanr@clemson.edu

clemson.edu/centers-institutes/cybersecurity
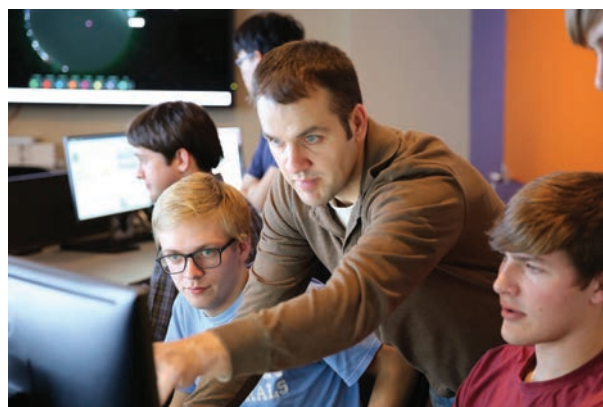
The Clemson Cybersecurity Operations Center trains students to monitor activity on Clemson's network, perform forensic investigations on past events, and create predictive analyses

COASTLINE COMMUNITY COLLEGE

Coastline Community College Campus

Coastline Community College has the honor of being the first California Community College to earn the designation as a Center of Academic Excellence in Cyber Defense (CAE). Located in Orange County, California, Coastline is designated as Hispanic, Asian-American, Native American, and Pacific Islander Serving Institutions and also serves traditional students, active-duty military, and veterans from across the country via onsite/online cybersecurity programs.

The goal of the CAE Cyber Defense Education program at Coastline is to reduce vulnerabilities in our national information infrastructure by promoting higher education and research in cyber defense and producing professionals with cyber defense expertise. Cybersecurity state approved degrees and certificates were developed in collaboration with business and industry partners to provide students with the knowledge and skills that align with the CAE Knowledge Units and the NICE Framework. Degrees that are offered at Coastline include: Associate Degrees in Computer Networking, Cybersecurity, and Microsoft MCSE. Certificates of Achievement and Certificates of Accomplishment are also offered in Cybersecurity, Cybersecurity Apprenticeship, Cisco CCNA, and CompTia to name a few.

Coastline is also proud to offer students a Registered Cybersecurity Apprenticeship program. This program offers students a series of eight online courses in networking and cybersecurity to prepare them for placement as registered paid apprentices. The program pays for tuition, textbooks, and industry certification exams.

DESIGNATIONS
- **CAE – Cyber Defense 2-Year Education**
- **CAE Regional Resource Center**

CONTACT INFORMATION

Professor Tobi West
(714) 241-6209 ext. 17338
Twest@Coastline.edu

www.coastline.edu

College of DuPage Seaton Computing Center

COLLEGE OF DUPAGE

College of DuPage (COD), Glen Ellyn, IL, serves approximately 27,000 highly diverse, traditional, and non-traditional students each semester on the largest single community college campus outside the state of California. COD has a highly developed infrastructure, deep academic expertise, and significant academic and industry relationships.

As we become increasingly engaged with and reliant on technology in our homes, schools, and workplaces, our vulnerability to malicious cyberattacks and information theft increases.

The Center for Cyber Defense Education at College of DuPage is dedicated to the development, promotion, and support of education, collaboration, and innovation in security technologies and management, information security assurance, and digital forensics across multiple academic and professional disciplines.

The Cybersecurity and Defense A.A.S. degree at COD provides students with a comprehensive foundation in the principles of cybersecurity and covers a variety of topics, including computers and criminal justice, homeland security, networks, routing and switching, servers and virtualization. The program consists of a minimum of 64 credits in General Education, degree program, and elective requirements. Upon completion of the program, students will be qualified for entry-level employment in a variety of positions in information systems.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Tony Chen
(630) 942-2537
chento@cod.edu
http://cod.edu/academics/programs/cyber_defense/index.aspx

COD professors Justin Wagner and Tony Chen

COLLEGE OF SOUTHERN NEVADA

CSN Charleston Campus Library

Founded in 1971, the **College of Southern Nevada** is the state's largest and most ethnically diverse, higher education institution, with more than 35,000 for-credit students per semester and 12,000 non-credit students per year. The college offers more than 180 degrees and certificates — including 25 available entirely online — in more than 70 areas of study. The college features several nationally or regionally prominent programs in high-demand fields, including cybersecurity. The cybersecurity program is the only one of its kind in Nevada, having the earned the designation National Center of Academic Excellence in Cyber Defense Education Two-Year Education (CAE-2Y). Many students are involved in an active cybersecurity club that regularly participates in National Cyber League competitions. Our students enjoy a robust experience in the program, with access to the latest technology, including a fully functional Faraday Cage encompassing an entire room. CSN offers its students real-world, hands-on experience before they ever leave the classroom. Our cybersecurity faculty is comprised of experts with experience in business and industry, academia, and law enforcement.

CSN specializes in two-year degrees and workforce development that allow students to prosper. The college also offers seven bachelor's degrees in specialized fields and is the state's largest provider of adult basic education and literacy training. CSN is a Minority Serving Institution and Nevada's first Hispanic Serving Institution. CSN is extremely accessible with three main campuses in Las Vegas, North Las Vegas, and Henderson, each covering 80 acres, as well as sites and centers placed throughout the southern Nevada area.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Margaret Taylor
(702) 651-2631
Margaret.Taylor@csn.edu

www.csn.edu/cybercenter

Cyber Security classroom with Faraday Cage

COLLEGE OF SOUTHERN MARYLAND

CSM Campus

College of Southern Maryland's (CSM) Cybersecurity Associate of Applied Science degree program prepares students for entry-level security positions and serves those already working in the field who wish to update their skills. On completion of the program, students will be prepared for entry-level positions in security or transfer to a four-year institution to complete a bachelor's degree in information assurance, information security, network management, network security, or cybersecurity.

Cybersecurity students will take classes that will help to prepare for the following in-demand entry level cybersecurity industry certifications: CompTIA A+, CompTIA Security+, CompTIA Linux+, and EC Council Certified Ethical Hacker (CEH). Depending on elective selections, students may take courses to prepare for these additional certifications: EC Council CHFI, AWS Certified Cloud Practitioner, and CISCO CCNA.

Students may be eligible to receive Credit for Prior Learning through Certification Evaluation for up to 15 credits with any of the following current certifications: CompTIA A+, CompTIA Security+, CompTIA Linux+, CISCO CCNA, EC Council CEH, EC Council CHFI, AWS Certified Cloud Practitioner, and ISC2 CISSP.

CSM also offers a certificate program that prepares students for entry-level positions in the information technology field such as Network Associate, Network Support Analyst, Network Technician, Network Administrator, Security Analyst, Security Administrator, IT Specialist. Graduates will be able to conduct network management and maintenance including router and switch configuration, firewall implementation and management, user access control, and network security monitoring.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Chris Estes
(443) 550-6156
CAEstes@csmd.edu

csmd.edu/programs-courses/cyber-center

CSM Cyber Class

MINES Campus

COLORADO SCHOOL OF MINES

Colorado School of Mines (Mines) is a globally known public university devoted to the education and research in engineering and science to solve the world's significant challenges related to the earth, energy, and environment. It is accredited through the doctoral degree by the Higher Learning Commission of North Central Association.

The mission of the Center for Cyber Security and Privacy (CCSP) is to support and promote cybersecurity and privacy education and research at the Colorado School of Mines and the region. CCSP is hosted in the Computer Science Department at Mines, which offers B.S., M.S., and PhD degree programs in Computer Science. CCSP fulfills its mission by leveraging the unique strengths of Mines in engineering and applied science education and research, promoting high-quality and high-impact cybersecurity and privacy research, bolstering cybersecurity and privacy education and training, fostering cross discipline and cross-institution collaboration, knowledge sharing, and resource sharing, and engaging the local communities and the region.

The education and research activities at CCSP are closely aligned with the Federal Cybersecurity R&D Strategic Plan, and with the National Centers of Academic Excellence in Cyber Defense Education (CAE-CDE) program requirements. The National Security Agency (NSA) and the Department of Homeland Security (DHS) have designated the Colorado School of Mines as a CAE-CDE institution through academic year 2021. Mines undergraduate and graduate students who complete our Cyber Defense Education requirements will receive an official Cyber Defense Education Certificate authorized by NSA and DHS.

DESIGNATIONS
• CAE – Cyber Defense Education

CONTACT INFORMATION

Chuan Yue
(303) 384-2439
chuanyue@mines.edu

ccsp.mines.edu

MINES Students

COLORADO STATE UNIVERSITY-PUEBLO

CSU-Pueblo Campus

The **Center for Cyber Security Education and Research (CCSER) at Colorado State University Pueblo (CSU-Pueblo)** has been designated as a Center of Academic Excellence in Cyber Defense Education since 2016. Mission objectives of CCSER include, but are not limited to providing educational outreach programs in cybersecurity to K-12 students, and all interested parties, institutions, and organizations in the wider Colorado area; producing a growing number of students and professionals with expertise in cyber defense that will contribute to the advancement of the field; providing collaboration opportunities among students, faculty, and public and private institutions committed to excellence in the areas of cybersecurity and information assurance; and seeking, encouraging, and developing alliances with other CSU-P departments and CAEs, as well as educational institutions and industry in order to pursue joint educational, research, and grant opportunities.

The CCSER is a technically oriented program within the Computer Information Systems (CIS) sector of the Hasan School of Business. CCSER emphasizes threat vulnerability analysis, cyber threats, system vulnerabilities, network traffic analysis, cyber defense, network administration, and computer forensics in addition to areas of study in block-chain technology and cybersecurity risk strategies.

The CCSER encourages all interested students to compete in the National Cyber League (NCL) cyber competition. Our CSU-Pueblo "CyberWolves" team has been ranked among the top 10 NCL teams in the nation during the last 2 years. Additionally, the CCSER has engaged several local area high schools students and teachers to compete in the NCL, which has created much excitement and interest in the fields of information technology and cybersecurity among high school students.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Roberto Mejias
(719) 549-2727
roberto.mejias@csupueblo.edu

csupueblo.edu/hasan-school-of-business/ccser
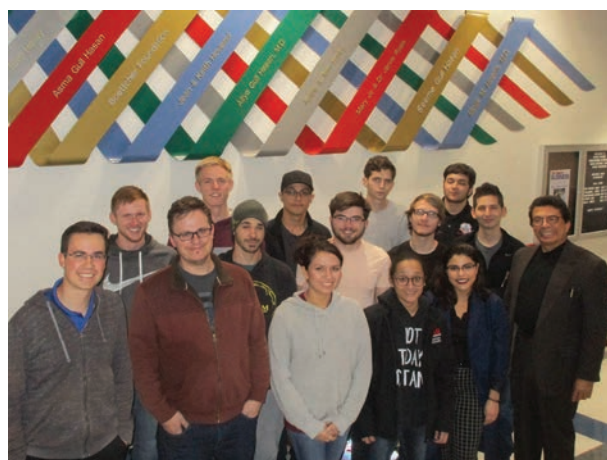
CSU-Pueblo CyberWolves: #4 NCL Ranked out of 373 National Teams, Fall 2018

Columbia Basin Campus

COLUMBIA BASIN COLLEGE

Columbia Basin College, Computer Science (CS) Department, was designated as a National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE-2Y) in 2017. This designation is given to schools that have proven a commitment to excellence in the field of Information Assurance and Cyber Defense Education. We are one of a few community colleges in Washington State with this designation. The Computer Science Department is committed to providing students and the community with the training, academic studies, and valuable hands-on experience necessary for employment in the Information Technology industry.

The Computer Science department offers Bachelor of Applied Science (BAS) degrees in Cybersecurity and Information Technology. The majority of the students pursuing Computer Science A.A.S. degrees transfer into our B.A.S. degrees. We accept A.A. and A.A.S.

degrees from other colleges into our Cybersecurity B.A.S. degree and our Information Technology BAS degree. The Computer Science Department provides students with access to cybersecurity practitioners through internships, guest lecturers, and events. The department also partners with many local companies to provide student internships. The Computer Science Department also has a Cyber club that is very active in many competitions.

Students who complete the following two-year Associate in Applied Science (AAS) degrees will receive a letter that contains the designation along with a listing of the CAE Knowledge Units (KU) completed.

 • Cybersecurity
 • Database Administration
 • Information Technology
 • Network Administrator

DESIGNATIONS
 • **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Debbie Wolf
(509) 542-4838
dwolf@columbiabasin.edu

columbiabasin.edu/computerscience

COLUMBUS STATE UNIVERSITY

CSU Campus

Columbus State University (CSU) has been a leader in cybersecurity education in the state of Georgia since its designation as a Center of Academic Excellence in Information Assurance Education (now Cyber Defense) in 2011. It received a $2.5 million gift in 2015 from Total Systems (TSYS) Inc., a leading global payments provider, to establish the state-of-the-art TSYS Center for Cybersecurity at CSU. Equipped with an open cyber range, the mission of the center is to produce computer science, information technology, and business graduates with advanced competency in cybersecurity, develop faculty expertise in cybersecurity, and provide training opportunities for businesses.

Since its redesignation as a CAE-CD in 2015, CSU has added a cybersecurity track in the BS Computer Science program, a master's degree, and a graduate certificate in Cybersecurity Management. The Master's in Applied Computer Science with a track in cybersecurity was ranked #1 in the Top Online Master's in Computer Science in the nation by GoGrad.org in 2016 and 2017, and ranked #2 by Intelligent.com in 2019. Year 2020 sees the launch of three new undergraduate programs – a BS in Cybersecurity, a BBA in Cybersecurity Management, and a Cybersecurity Practitioner Certificate in Financial Technology (FinTech).

The School of Computer Science at CSU has received more than $1 million in grants from the NSA to host competitions, offer summer workshops, develop middle school curriculum, and build intelligent tools for cybersecurity training. Recent successes at CSU include $365,000 from the NSF to continue the REU@CSU Research Experiences for Undergraduates Site in Security and Privacy for Mobile Sensing and IoT from 2020 to 2022.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

TSYS School of Computer Science
(706) 507-8170

cs.columbusstate.edu/cyber

CSU IoT Cybersecurity Lab

COMMUNITY COLLEGE OF RHODE ISLAND

Community College of Rhode Island Campus

The National Security Agency and the Department of Homeland Security have designated the **Community College of Rhode Island** as a National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE-2Y) through academic year 2023. CCRI, the largest public, two-year, degree-granting college in New England, provides a variety of career, technical, and academic programs at four main campuses in Warwick, Lincoln, Providence, and Newport as well as online and at the Westerly Education Center. CCRI's cybersecurity program is designed to provide students with a strong foundation in the principles and methods of cybersecurity, as well as the fundamental knowledge and tools for applying security measures across a variety of network architectures and settings.

In addition to providing the groundwork for pursuing a bachelor's degree in cybersecurity, this associate degree program provides the educational background and hands-on training necessary to prepare students for entry in the cybersecurity sector and meets NSA and Centers of Academic Excellence core foundational content and standards.

At the core of the associate degree program is the cyber defense path, composed of the critical networking and cybersecurity-based classes that are the courses used in the KU mapping for this designation. The courses include Programming Concepts, Introduction to Computer Ethics, Introduction to Cybersecurity, Database Design and Management, Networking Technology, Intermediate Networking, and Network Security Hardware. Students who complete these core courses are awarded a certificate of completion that recognizes that they have completed the cyber defense path as part of the cybersecurity curriculum at CCRI.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Michael Kelly
(401) 825-1149
kelly@ccri.edu

ccri.edu/comp/cybersecurity

Rhode Island Cyber Range

COUNTY COLLEGE OF MORRIS

CCM Campus, New Jersey

Located on 222 acres of rolling terrain in Randolph, NJ, **County College of Morris (CCM)** has been meeting the educational and training needs of residents and businesses in Morris County for 50 years. CCM is focused on excellence in teaching and lifelong learning through the delivery of exceptional programs and services that reflect a dedication to inclusiveness and diversity, educational advancement, cultural enrichment, and workforce development. A dedicated faculty engaged in research and practice provides CCM students with a learning environment that has produced one of the highest graduation and transfer rates among community colleges in New Jersey.

For over two decades, CCM has been a local and national leader in information security education. Since 2003, we have been a certifying institution for the NSA's NSTISSI-4011 National Training Standard for Information Systems Security (INFOSEC) Professionals. In January 2017, we became designated as a National Center of Academic Excellence in Cyber Defense. We were the first and only community college in New Jersey to receive this designation. There are a limited number of two-year schools in the country that have achieved this national recognition.

Our faculty members are recognized nationally as expert educators and leaders in setting the direction of our nation's information security curriculum. It is the mission of the CCM Center for Cyber Security to educate our future cybersecurity professionals, increase awareness for students in other disciplines, and prepare our greater community to be better cyber citizens.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Patricia Tamburelli
(973) 328-5799
ptamburelli@ccm.edu

ccm.edu

Morris County Celebrates CCM's Designation as a National Center of Cyber Defense Excellence in Cyber Defense Two-Year Eduction

Cypress College

Cypress College Campus

The **Cybersecurity Center at Cypress College** was designated as a Center of Academic Excellence in 2018. Our mission is to advance cybersecurity education by providing curriculum, resources, support, and collaboration to develop and implement effective pathways to increase cybersecurity professionals. We offer cybersecurity and cyber defense certificate programs and an Associate of Science in Cyber Defense. After completing our program, students are prepared for industry recognized certifications including ITF+, Cloud Essentials, Network+, Security+, CySA+, CCNA, and Cyber Ops.

Our center is involved in the Pathway to Advancement of Cybersecurity Education (PACE) program funded by Small Workforce Program (SWP) and the National Science Foundation (NSF). The goal of PACE is to develop and implement pathways from middle school all the way to a four-year college with multiple opportunities for employment exit points. Specific goals include:

• Embed cybersecurity content in middle school/high school curricula
• Provide outreach to generate interest in cybersecurity
• Offer cybersecurity dual-enrollment courses to middle school/high school students
• Provide articulation and alignment with high school and 4-year institutions
• Increase student enrollments in cybersecurity
• Recommend best practices and disseminate PACE results

During the 2019 academic year, 508 students completed our cybersecurity courses, 90 students obtained CompTIA and/or Cisco industry certificates, and 53 students completed one of our cybersecurity certificate programs (12 to 24 units). Additionally, 1708 middle and high school students participated in our CyberPatriot training and competition events. CyberPatriot is our outreach program where our college student mentors provide weekly after-school training at six different middle and high schools in the community.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Ben Izadi, Ph.D.
(714) 801-3354
bizadi.cypress@gmail.com

cypresscollege.edu

Dr. Izadi Working with cybersecurity students.

DAKOTA STATE UNIVERSITY

DSU Campus

Since 2004, **Dakota State University (DSU) has** been a proud contributing member of the Center of Academic Excellence (CAE) Community. They are one of a select few institutions that hold all three CAE designations.

Enrollment growth over the past five years in the undergraduate programs at DSU has been astounding! 2019 boasted a 23% overall freshman headcount, combined with a 50% increase in the number of bachelor's degrees awarded as well as a 160% increase in the number of doctoral degrees awarded.

DSU was one of the first four institutions in the nation to be designated CAE-Cyber Operations in 2012. They were an early adopter of the CyberCorps(r) scholarship program where they currently have 31 active scholars and a total of 91 students funded to date.

As a national leader in GenCyber, DSU hosts the largest residential camp in the country covering a full array of participants: middle school girls camp, rising high school camps, and secondary teacher camps. Over 2500 participants have attended since 2014.

In 2020, DSU opened its new Madison Cyber Labs facility providing faculty, students, and researchers the space, technology, and infrastructure to support exploration in cyber related research and technology application across many industries. It provides an atmosphere for exploration and advancement in research, technology application, workforce development, business expansion, and economic growth.

DESIGNATIONS

- **CAE - Cyber Defense Education**
- **CAE - Cyber Defense Research**
- **CAE - Cyber Operations**

CONTACT INFORMATION

CAE-CDE - Dr Kyle Cronin
(605) 256-5849; kyle.cronin@dsu.edu

CAE-CO - Dr Mike Ham
(605) 256-5661; Michael.ham@dsu.edu

Student working on servers

DCC Campus
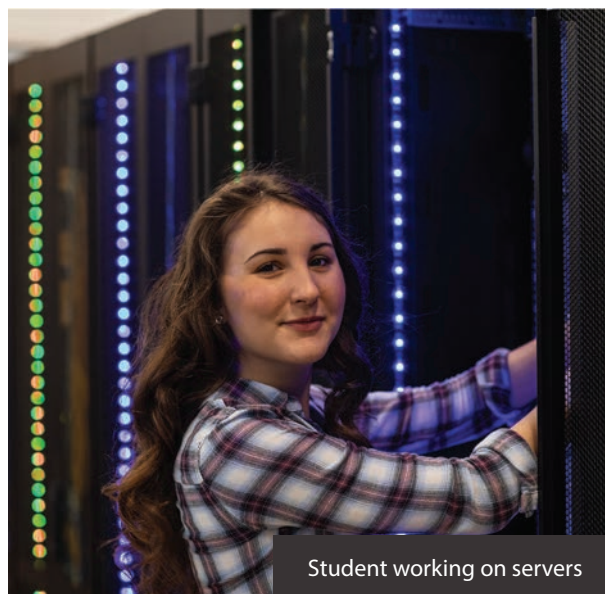
Danville Community College (DCC) is located in the most southern part of Virginia providing training to a very rural, agriculturally based, service region. DCC is designated as a National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE-2Y). DCC's cybersecurity programs provide curriculums that are mapped to the Centers of Academic Excellence (CAE) standard. These programs also provide students with the opportunity to take coursework both online and in traditional classroom based settings, meeting the diverse needs of our students in this service region as well as local community.

Since DCC's service region is considered rural, obtaining the CAE-2Y designation has provided our students with access to training that would otherwise not be available to them. As an added benefit, DCC's

Cybersecurity and Cybercrime Investigation Certificate programs are transferrable to many four-year institutions and provides cybersecurity skills needed for companies like Microsoft, CISCO, and Perspecta that have job opportunities in our area along with local banks and IT support industries. This has been a positive factor in other industries to consider this area for their corporate needs.

The opportunities that DCC offers to our students include participating in a variety of events such as cyber competitions and extra-curricular activities and membership in the DCC Cyber Knights Club. These students have also benefitted from the experience of traveling to these competitions as well as various field trips to local IT facilities to explore the opportunities available to them from completing the various cyber programs we offer.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Steven Carrigan, Cyber Center Director
(434) 797-8528
scarrigan@dcc.vccs.edu

Danville.edu/CyberCenter

DCC Technology Center

Davenport University Campus

Davenport University, a private, nonprofit institution located in Michigan, offers a practical and career-oriented curriculum that leads to associate, bachelor's, and master's degrees through a network of campuses located throughout the state of Michigan and online. Founded in 1866 in Grand Rapids, Michigan, Davenport University offers more than 50 fields of study in the Arts and Sciences, Business, Technology, Healthcare, and Urban Education. DU is accredited by the Higher Learning Commission – North Central Association of Colleges and Schools.

Since first achieving CAE status in 2011, the College of Technology established and maintains an actively growing Information Security and Assurance Center known as ISaAC. ISaAC is a hub for up-to-date security-related information including current news and research, faculty biographies, undergraduate and graduate program information, internship and job postings, and security resources.

To complement the Information Assurance program, the College of Technology developed a bachelor's program in Digital Forensics. Students in this program are immersed in hands-on activities ranging from conducting investigations to analyzing intrusions on mobile devices, personal computers, storage devices, and networks. The Digital Forensics program was designated a Center of Academic Excellence in Digital Forensics (CDFAE) by the DoD Cyber Crime Center (DC3) in 2015.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Dr. Lonnie Decker
(989) 794-1941
Lonnie.Decker@davenport.edu

davenport.edu/college-of-technology

Deventport Cyber Forensics Challenge

DSC Advanced Technology College

Daytona State College created the Center for Cybersecurity and Cyberforensics to meet the demands for high-quality education and training. Through our nationally recognized center, students receive the education and training they need for jobs that secure our community, state, and the Nation's computers, networks, and critical infrastructure.

The quality of programs at Daytona State is recognized by several entities attesting to the value of the curriculum, instruction, and administrative support. In 2015, the college joined a handful of institutions nationwide as a Center of Digital Forensics Academic Excellence (CDFAE) by the Defense Cyber Crime Center which sets standards and best practices for digital forensics practitioners, educators, and researchers. In 2016, Daytona State was designated as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE)

by the National Security Agency and Department of Homeland Security.

Daytona State has consistently been recognized as a leader in higher education by U.S. News & World Report, which ranks the college among the Top Tier Best Online Bachelor's Programs. The U.S. Department of Education's College Affordability and Transparency Center has ranked Daytona State among the top 50 most affordable public four-year institutions in the country, with less than half the tuition of the national average. And U.S. News & World Report has ranked Daytona State among its Top Online Bachelor's Programs for Veterans.

Offering more than 100 certificates, associate, and bachelor's degree programs, Daytona State College has responded to the education and workforce training needs of Volusia and Flagler counties and beyond for more than 60 years.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Patrick Vilkinofsky
(386) 506-4183
Patrick.Vilkinofsky@daytonastate.edu

daytonastate.edu/cybercenter

FSCJ student in the lab

DEPAUL UNIVERSITY

The College of Computing and Digital Media Building, located in the heart of downtown Chicago

DePaul University is the largest Catholic university in the United States and the largest private, nonprofit university in the Midwest, with nearly 22,500 students. Our tradition of providing a quality education to students from many different ethnic, religious, and geographic backgrounds, with particular attention to first-generation students, has resulted in one of the nation's most diverse student bodies. DePaul offers over 300 academic and professional programs for undergraduate and graduate students. Here, our students gain hands-on experience through internships, service, and learning opportunities across Chicago.

The College of Computing and Digital Media houses the School of Computing, which features technical degrees in computing, cybersecurity, health informatics, information systems, and data science.

Students in the BS and MS Cybersecurity programs learn how to design, implement, and maintain systems designed to support security policy and networking architecture consistent with mitigating risk and preventing attacks. The program curriculum is developed in cooperation with an industry advisor board—leaders in business who meet regularly with our faculty to ensure students are getting the skills employers are looking for. Extensive labs, accessible locally and remotely, provide a great infrastructure to support a hands-on education.

Our campus is located in the heart of Chicago's business district and we offer a robust array of online courses as well. Students have access to 100 percent of their program's lectures captured and available online. The MS in Cybersecurity can be completed entirely online.

DESIGNATIONS

• **CAE-Cyber Defense Education**

CONTACT INFORMATION

Jacob Furst
(312) 362-5158
jfurst@cdm.depaul.edu

cdm.depaul.edu

CDM emphasizes hands-on learning with equipment in a dedicated Security Lab

EAST COAST POLYTECHNIC INSTITUTE AND UNIVERSITY

ECPI University has sixteen locations and is online

Founded in Norfolk, Virginia in 1966, **ECPI University** has long-demonstrated a commitment to forward-thinking, market-based curriculum, being among the first to offer classes in the field of computer programming. Now offering programs in nursing, health science, technology, business, criminal justice, and the culinary arts, ECPI University has established a solid reputation for integrating high-quality instruction with application-based learning that is aligned with the employment marketplace. Twice yearly, academic advisory boards made up of professionals in their particular field, gather at each campus to review curriculum and make recommendations based on the ever-changing needs of the workplace.

ECPI University offers a military-friendly, student-centered environment, featuring small class sizes, free tutoring, and career services. Taking two classes at a time, students can earn college credit every five weeks. Maintaining that pace, they can earn a bachelor's degree in 2.5 years or an associate degree in 1.5 years. Classes are offered day, night, and online. Faculty members incorporate an array of hands-on activities to reinforce learning and retention, allowing students to quickly apply what they learn in the workplace.

ECPI University is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) to award the associate, baccalaureate, and master's degrees and diplomas. SACSCOC is the regional body for the accreditation of degree-granting higher education institutions in the southern states. ECPI University now has campuses in Virginia, North Carolina, South Carolina, Florida, and Texas.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Keith Morneau, Ed.D
(703) 330-5300
kmorneau@ecpi.edu

ecpi.edu

ECPI University Cyber Student

EASTERN MICHIGAN UNIVERSITY

EMU Campus

The Information Assurance and Cyber Defense program at **Eastern Michigan University** places emphasis on design, integration, administration, hardening, and protection of all types of computer information systems and network infrastructures in cyber environments.

Our mission is to support the computing and cybersecurity needs of local, regional, and national government and private organization through excellence in education, scholarship, and service. We are committed to providing quality educational opportunities to both traditional and non- traditional students and seek to equip our students with the knowledge and skillset necessary for future computing and cybersecurity professionals to build, maintain, and protect networks and computer systems in both government and industry.

Our students are immersed in solid theories as well as intensive hands-on practical experiences to enhance their critical thinking and problem-solving capabilities applied to all elements in modern computing disciplines.

Our curriculum covers:

• Computing and networking theories/practices
• System architecture and administration, integration, and troubleshooting
• Cybersecurity threat/risk evaluation
• Incident response analysis and practice
• Network/digital forensics and investigation
• Penetration testing and system auditing
• Cyber laws, legislation, policy/compliance, and project management

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Sean Che
(734) 487-2490
xche@emich.edu

emich.edu/cot/isac/programs/ia

EASTERN NEW MEXICO UNIVERSITY
RUIDOSO BRANCH COMMUNITY COLLEGE

ENMU-Ruidoso Campus

Eastern New Mexico University – Ruidoso Branch Community College (ENMU-Ruidoso) currently serves as a Title V institution for Hispanics, has a strong dual credit program with nineteen high school students enrolled in cybersecurity certificate program for the Mescalero Apache Tribe, Mescalero High School, and is planning to expand to the local high schools in Lincoln County, New Mexico.

The A.A.S. in Information Systems (IS) Cybersecurity is designed to introduce students to contemporary information systems security and information assurance and to demonstrate how these systems are used throughout global organizations. The focus of this program will be on the key components of information systems assurance and cybersecurity; people, software, hardware, data, security, and communication technologies, and how these components can be integrated and managed to create competitive advantage. The National Security Agency and the Department of Homeland Security have designated ENMU-Ruidoso as a National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE-2Y). This program is specifically designed to prepare students in the National Initiative in Cybersecurity Education (NICE) framework for Operate and Maintain and Protect and Defend, and provide current information systems professionals with an Information Systems Security certificate to meet the needs of current and future employer requirements.

The program maps to a Cybersecurity Technician job position based on NICE framework. Upon completion of this program, students will receive a university certification of completion, the CompTIA Security+ and EC - Council Certified Ethical Hacker (CEH)™ industry certification in addition to their degree.

DESIGNATIONS

• CAE-Cyber Defense Education

CONTACT INFORMATION

Stephen Miller
(575) 808-1138
Stephen.miller@enmu.edu

ruidoso.enmu.edu/index.php/cyber

Ruidoso Eastern New Mexico University (ENMU)
Professor Stephen Miller
(Photo: Rita Greene/Ruidoso News)

EAST STROUDSBURG UNIVERSITY

ESU's Hoeffner Science and Technology Center

East Stroudsburg University has been designated a National Center of Academic Excellence in Cyber Defense Education since 2003. The Computer Security program is taught by faculty that are dedicated to cybersecurity and information assurance education, training, research, literacy, and awareness.

In 1999, the East Stroudsburg University (ESU) Computer Science Department began to develop our Undergraduate Computer Security program, offering the first Computer Security course in 2000. By 2002, ESU offered students a Bachelor of Science degree in Computer Security, the first such undergraduate degree in the United States.

Our rigorous baccalaureate program requires courses in introductory computer science, introductory and advanced cybersecurity, and advanced mathematics. Our students round out their education with coursework designed to foster critical thinking, develop communications skills, and impart an ability to navigate a complex, diverse, and global society.

With small class sizes for courses within the major, ESU is able to provide quality education to the individual student. East Stroudsburg University is proud to play a significant role in developing a strong, capable, and technologically proficient workforce that is equipped to manage and protect our critical cyber infrastructure.

DESIGNATIONS

• **CAE-Cyber Defense Education**

CONTACT INFORMATION

Mike Jochen, Ph.D.
(570) 422-3036
mjochen@esu.edu

quantum.esu.edu/compusec
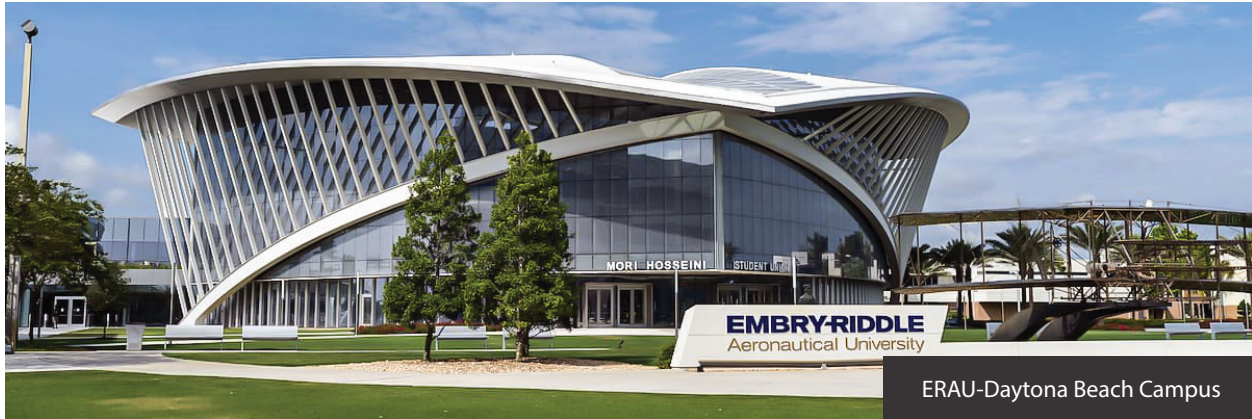
ERAU-Daytona Beach Campus

As the world's oldest, largest, and most prestigious university specializing in aviation and aerospace, research and education in cybersecurity at **Embry-Riddle Aeronautical University (ERAU)** have grown significantly in recent years, particularly in the area of aviation-related cybersecurity. ERAU – Daytona Beach campus was designated in 2016 as a National Center of Academic Excellence (CAE) in Cyber Defense Education, carrying also a Secure Software Development focus, the only institution in the State of Florida to have this specialized designation.

The Cybersecurity and Assured Systems Engineering (CyBASE) Center at ERAU – Daytona Beach campus performs research in cybersecurity associated with critical infrastructures and assured systems, such as aviation and aerospace systems. CyBASE projects are carried out in the Cybersecurity Engineering Lab (CybEL) and the Avionics Cybersecurity Lab depending on the needs of specific projects. Furnished with state-of-the-art hardware and software to permit involvement in cybersecurity attack and defend exercises, the CybEL facility is isolated from the outside world. Designed to meet instructional and research needs in the area of cybersecurity, CybEL also includes a visualization infrastructure to apply techniques and display information to cyber-attack related data. The Avionics Cybersecurity Lab employs experienced faculty and students motivated to performing research on a broad range of topics that focus on the design, development, and implementation of techniques and tools for cybersecurity assessment and protection of avionics systems and airborne systems.

ERAU – Daytona Beach offers a Cybersecurity Engineering Area of Concentration within the Bachelor of Science in Computer Science, a Cybersecurity Engineering Minor, and the Master of Science in Cybersecurity Engineering.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Radu F. Babiceanu
(386) 226-7375
babicear@erau.edu

daytonabeach.erau.edu/about/labs/cybase

ERAU-Daytona Beach Cybersecurity Center

ESTRELLA MOUNTAIN COMMUNITY COLLEGE

EMCC Main Campus Avondale

Estrella Mountain Community College (EMCC) was designated a CAE-2Y institution in 2014. This Hispanic Serving Institution offers the Information Technology Security Certificate as well as the Information Technology and Power Systems Security Associate of Applied Science (A.A.S) degree.

This program is uniquely positioned to help combat the shortage of highly trained cybersecurity technicians. The program teaches students essential cybersecurity concepts and allows them to specialize in an area. Students are able to select from one or more of the following specializations: Network Security, Linux Systems Security, Microsoft Systems Security, and Power Systems Security. The Power Systems specialization focuses exclusively on the power and energy sector and has been described as a one-of-a-kind by various industry representatives.

EMCC's cybersecurity curriculum was developed through a close working relationship with an industry advisory board that is composed of representatives from the public and private sectors. Furthermore, the curriculum went through a rigorous vetting during the spring of 2017 by local cybersecurity industry members. The relationships and information gleaned from the vetting process has been used to improve EMCC's curriculum and to help guide students towards internships and/or employment.

As students' progress through the program, their coursework will provide them the required skills necessary to make them sought after job candidates. Additionally, the curriculum prepares them for the rigors of IT security industry certification exams.

DESIGNATIONS

• CAE-Cyber Defense 2-Year Education

CONTACT INFORMATION

Tom Polliard
(623) 935-8559
thomas.polliard@estrellamountain.edu

www.estrellamountain.edu
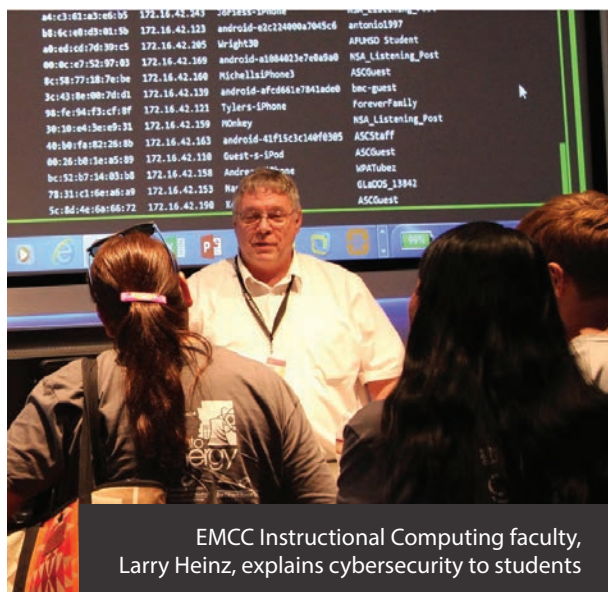
EMCC Instructional Computing faculty, Larry Heinz, explains cybersecurity to students

EXCELSIOR COLLEGE

Excelsior College campus

Founded in 1971, **Excelsior College** is a regionally accredited, not-for-profit, distance learning institution that focuses on providing educational opportunity to adult learners. The College contributes to the development of a diverse, educated society by valuing lifelong learning with an emphasis on serving individuals who are historically underrepresented by higher education. Excelsior meets students where they are academically and geographically by removing obstacles to the educational goals of adult learners through affordable access to quality instruction and the assessment of learning.

Excelsior College is designated by the National Security Agency and Department of Homeland Security as a National Center of Academic Excellence in Cyber Defense Education. Its career-aligned cybersecurity curriculum expands across several online programs at the undergraduate and graduate

levels. Excelsior's programs and experienced faculty prepare students for advancements in such areas as cyber operations, cybersecurity management, cybersecurity technology, and nuclear cybersecurity. Undergraduate and graduate level courses prepare students for industry certification exams, including the Security+ certification, in addition to contributing to a rich program experience.

The National Cybersecurity Institute (NCI) at Excelsior College is a center for cyber defense education dedicated to assisting government, industry, military, and academic sectors meet challenges in cybersecurity policy, technology, and education. In addition, NCI targets the development of effective cybersecurity practice in specific sectors, including health care, finance, utilities, energy, telecommunications, education and training. NCI sponsors Excelsior students to participate annually in cyber competitions. Excelsior was awarded the 2018 GenCyber NSA/NSF Grant to host a cybersecurity camp for middle and high school educators.

DESIGNATIONS

• **CAE-Cyber Defense Education**

CONTACT INFORMATION

Dr. Ethan Sprissler
(518) 608-8197
esprissler@excelsior.edu

nationalcybersecurityinstitute.org

FAIRLEIGH DICKINSON UNIVERSITY

FDU Metropolitan Campus

Fairleigh Dickinson University (FDU) is a National Center of Academic Excellence dedicated to the preparation of world citizens through global education. The University strives to offer students with the multi-disciplinary, intercultural, and ethical understandings necessary to participate, lead, and prosper in the global marketplace of ideas, commerce, and culture.

Founded in 1942 by Dr. and Mrs. Peter Sammartino, FDU has grown into the largest private university in New Jersey. Today, more than 11,500 students from 32 states and 72 countries are enrolled on the University's two campuses in northern New Jersey and its international campuses in Wroxton, England and Vancouver, Canada. FDU offers multiple undergraduate and graduate degrees and certificate programs in STEM-related disciplines through its four colleges and schools on three campuses. It has

offered degree programs in computer science since 1975 and concentrations in cybersecurity since 2010. The undergraduate information technology program started in 2004 and offered a concentration in security and forensics in 2015.

FDU Center for Cybersecurity and Information Assurance was established in 2012, paving the way for FDU's CAE-IAE and CAE-CDE designations in 2013 and 2015, respectively. Our CAE designation has resulted in a steady growth of student enrollment, engagement of faculty in course and program developments, and thriving student research and scholarship for service experiences through the NSA Cybersecurity National Action Plan (CNAP) grant and DoD Cyber Scholarship funding. Ongoing faculty research on hardware, IoT, artificial intelligence, and physical security further strengthens the training of high quality and skilled cyber defenders for our country.

DESIGNATIONS

• CAE-Cyber Defense Education

CONTACT INFORMATION

Dr. K. Mondal
(201) 692-2123
mondal@fdu.edu

www.fdu.edu

FDU Florham Campus

FAYETTEVILLE TECHNICAL COMMUNITY COLLEGE

FTCC Campus

Fayetteville Technical Community College (FTCC) is well positioned to respond to the regional demand for skilled cybersecurity workers. The college, which began serving students since 1961, currently offers 283 degree and certificate programs of study to over 4500 full-time and 7000 part-time students, as well as a wide variety of non-credit, continuing education courses to nearly 17,500 students annually.

FTCC offers a comprehensive and rigorous Information Assurance and Cybersecurity program. In 2018, the school was designated as a National Center of Academic Excellence in Cyber Defense Education (CAE-2Y) by the National Security Agency and the Department of Homeland Security. The Systems Security & Analysis program prepares students for jobs in IT security such as computer network defense analysts, infrastructure support,

and intrusion detection system (IDS) technicians. Additionally, FTCC is part of the National Center Initiative for Cybersecurity Careers and Studies, National CyberWatch Center, National Cyber Security Alliance, and the Fayetteville/Ft Bragg ISSA Chapter. Fayetteville Technical Community College also has multiple industry partners that currently include Cisco, CompTIA, EC-Council, Microsoft, NDG, Palo Alto, RedHat, SAS, and VMWare.

Currently, FTCC offers an Associate Degree in Systems Security & Analysis along with certificate options in cybercrime, network defense, and Linux.

Geographically, FTCC is located in a region with intense cybersecurity research activity, situated in close proximity to Fort Bragg, Camp Lejeune, and the Research Triangle Park (RTP) area.

DESIGNATIONS

• **CAE-Cyber Defense 2-Year Education**

CONTACT INFORMATION

Chris Herring
(910) 678-8509
herringc@faytechcc.edu

www.faytechcc.edu

FERRIS STATE
UNIVERSITY

FERRIS STATE UNIVERSITY

FSU Campus

The **Information Security and Intelligence (ISI)** program at **Ferris State University** started in the fall of 2007. Rather than modifying an existing program, the ISI program was created from the ground up with cybersecurity and intelligence in mind. The ISI program was developed in consultation with several corporate and government agencies after a 2006 brainstorming session in Washington, DC. The ISI programs have been designated as a National Security Agency Center of Academic Excellence in Cyber Defense (2011), as well as a Department of Defense/Air Force Cyber Command Center of Digital Forensic Academic Excellence (2013), the first university in the United States to achieve this designation.

In 2017, the ISI undergraduate program earned ABET Engineering Accreditation for cybersecurity, one of the first seven universities in the nation to achieve

this distinction. ABET accreditation is evidence that a collegiate program has met standards essential to produce graduates ready to enter the critical fields of STEM education. Furthermore, the ISI undergrad and MISI masters programs are highly ranked by many national organizations and are the premier cybersecurity degrees in the state of Michigan.

From its inception, the ISI program has been a national leader in cybersecurity and data science. The ISI program includes a Bachelor of Science with concentrations in digital forensics, penetration testing, and data mining. ISI graduates are employed in a variety of career fields including security analysts, data analysts, digital forensic investigators, FBI special agents, NCIS special agents, risk analysts, penetration testers, and compliance officers.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Greg Gogolin
GregGogolin@ferris.edu

isi.ferris.edu
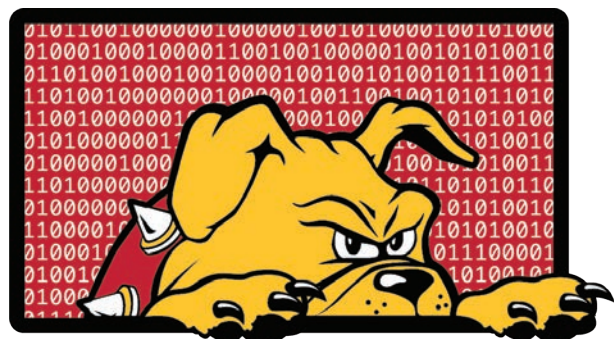
FSU Information Security and Intelligence Logo

Entrance to FAU's Main Campus

Florida Atlantic University's Center for Cryptology and Information Security (CCIS) was established in the fall of 2003 by Spyros Magliveras as a FAU College of Science center with funding provided by a federal earmark. Today it is founded on the unique strengths of cryptology and information security specialists in four different colleges of FAU: the College for Design and Social Inquiry, the College of Business, the College of Engineering and Computer Science, and the College of Science. In July 2016, FAU and the Airforce Research Laboratory, Information Directorate, Rome, New York, US (AFRL/RI) entered into an Education Partnership Agreement for a period of 5 years. Moreover, CCIS established an MoU with the Spanish National Cybersecurity Institute (INCIBE).

Research of the center faculty is funded through various national and international sources and covers a broad spectrum of topics, including cryptology, cybercrime, cyber forensics, operational cybersecurity, critical infrastructure security, data analytics, internet measurement, secure systems, security from an interdisciplinary perspective, social perspectives of information security, and more.

Center faculty is actively involved in the organization of major scientific conferences, and two managing editors of the Journal of Mathematical Cryptology are with CCIS. FAU is well known for its work in quantum-safe cryptography, including the co-authorship of four semi-finalists in NIST's ongoing standardization effort in post-quantum cryptography, participation in an International Telecommunication Union's study group to develop standards for quantum cryptography, and a 2018 NATO Science for Peace and Security Partnership Prize for a project in the area of post-quantum cryptography.

DESIGNATIONS

• CAE – Cyber Defense Research

CONTACT INFORMATION

Rainer Steinwandt
561-297-3353
rsteinwa@fau.edu

science.fau.edu/cryptology

A conversation on one of FAU's six campuses.

FLORIDA A&M UNIVERSITY

FAMU | FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

FAMU Campus

At **Florida A&M University,** we recognize the incessant importance of information security. The **Florida A&M University Center for Cyber Security (FCCS)** recognizes that as technology advances, the world becomes progressively more challenging. FCCS focuses on education and research and development for all aspects of information security, including systems vulnerability assessment, theory development and formalization methodologies and mobile digital forensics. FCCS is aligned with and supportive of Florida A&M University values and mission which include:

• To promote, coordinate, implement education research and innovation in cyber defense and cybersecurity
• Ensuring participation in FCCS research projects and educational endeavors is open to faculty, visiting scholars, undergraduate, and graduate students including students from diverse disciplines and underrepresented populations
• Promote and value teaching, scholarships, and active learning
• Encourage experimentation, innovation, and creativity and involve graduate and undergraduates in cyber defense and cybersecurity research

FCCS core objectives and purpose include:

• Offer coursework leading to certificates in Cyber Defense and Cybersecurity that align with National Security Agency and Department of Homeland Security standards as defined by the National Centers for Academic Excellence Cyber Defense Program Office
• Increase minority participation in CD and Cybersecurity related careers
• Support university initiatives and projects CD and Cybersecurity
• Establish a program of research in CD and Cybersecurity
• Serve as a community, regional, and national resource for educational institutions, small businesses, and the general population

The activities of the FCCS fall into five major areas which include:

• Research
• Curriculum and standards
• Education and training
• Service and outreach

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Hongmei Chi
(850) 412-7355
hongmei.chi@famu.edu

famu.edu/index.cfm?cybercenter

FLORIDA INSTITUTE OF TECHNOLOGY

HIAI is located in the Harris Center for Science and Engineering

In 2009, **Florida Tech** founded the **Harris Institute for Assured Information (HIAI)** to serve as the University's focal point for research and education in cyber defense. The National Security Agency and Department of Homeland Security designated Florida Tech as a Center of Academic Excellence in Cyber Defense Research in 2011. HIAI provides labs and infrastructure for faculty and students engaged in cyber defense-related research. The president of Florida Tech and board of trustees designated cybersecurity as the first of five Pillars of Excellence. This designation represents the University's commitment to cyber defense research and education with significant local and national impact.

Research at HIAI includes distributed coordination and command and control for cyber operations, cyber emulation environments, human-computer interaction, biometric authentication, and Internet of Things. Over the past 5 years, HIAI has been awarded over $9 million in research funding and has supported the cyber defense-related research activities of a total of 12 Ph.D. and 9 masters of science students.

Faculty and students at Florida Tech actively participate in research in all six of the core cyber defense areas, as demonstrated by a wide variety of publications, patents, research collaborations, and technology transfer agreements with local and national corporations, government agencies and universities, including DHS, DARPA, DoD, AFRL, Mitre, Harris Corporation, Raytheon/BBN, Notre Dame University, University of Florida, and Worchester Polytechnic Institute.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Marco Carvalho
(321) 674-8767
mcarvalho@fit.edu

hiai.fit.edu

Florida Tech Cyber Range

FLORIDA STATE COLLEGE AT JACKSONVILLE

FSCJ Advanced Technology Center

Florida State College at Jacksonville's (FSCJ) Associate in Science (A.S.) in IT Security degree program is for individuals interested in beginning or advancing a career in computer/network security. This hands-on program focuses on digital forensics, intrusion detection, penetration testing, scripting, and networking. The program provides students the skills needed to investigate computer, cyber, and electronic crimes and focuses on digital forensics techniques and procedures, assuring that digital evidence is accurate, complete, and reliable. Students with specific current industry-recognized certifications such as CompTIA's A+, Security+, Microsoft, and Cisco may receive credit for the associated college credit course.

FSCJ Center for Cyber Security works to advance the practice and public awareness of information technology (IT) security through education and service. Our faculty offer guidance to students, members of different academic disciplines across the College, local government, and industry partners.

In 2018, FSCJ hosted a five-day hands-on summer camp for teenage students in Jacksonville interested in cybersecurity. The camp was developed by FSCJ, FBI Jacksonville cyber squad, and Infragard. The students worked with FBI agents during the summer camp and helped them understand the importance of behaving responsibly online. The camp also provided a hands-on, behind-the-scenes access to some of the FBI's work, a SWAT demonstration with special agents in full uniform, remote controlled robots, and life-saving equipment. The camp introduces boys and girls from ages 14 to 17 to the world of cybersecurity. It showed them all the opportunities available for those who want a future in cybercrime fighting.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Ernie Friend
(904) 598-5650
efriend@fscj.edu

fscj.edu/cybersecurity
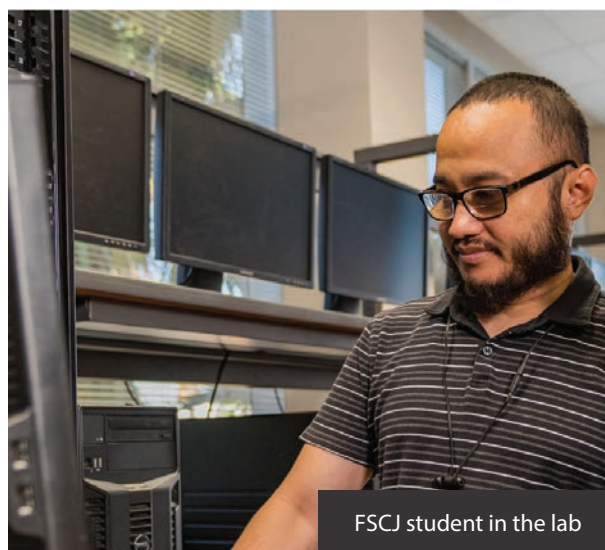
FSCJ student in the lab

FORDHAM UNIVERSITY

Fordham University NYC campus

The **Fordham Center for Cybersecurity** offers an intellectual home for cybersecurity students and faculty and for the broader Bronx community. This interdisciplinary center brings together diverse members of the Fordham community to promote educational, research, and service projects in the area of information and computer security that benefit our neighbors and fellow New Yorkers.

Designed for both working professionals and students and taught by leading experts in academia and industry, Fordham's unique, one-year Master of Science in Cybersecurity is delivered in the heart of New York City through a combination of weekend, evening, online, and hybrid courses. Offering small classes and close mentorship, this program offers six classes (up to 12 credits) online and in-person.

Using methods in computing, information science, engineering, and social science, our students learn how to identify solutions to global cyber threats while mastering legal, ethical, and policy issues in this critical field of study. Fordham's core curriculum is designed to focus exclusively on cybersecurity, which provides students with the depth of knowledge and formal training that is ever more vital to employers across the professional cybersecurity landscape.

With nearly one in five Americans falling victim to a cybercrime, the demand is high for skilled analysts with cutting-edge knowledge of how to detect, prevent, and recover from a cyberattack. Our graduates are fully-prepared to help protect commercial networks, critical information infrastructure, and national security information systems and can feel confident that their academic program will prepare them to compete successfully for rewarding careers in this growing and lucrative field.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Thaier Hayajneh
(212) 636-7785
thayajneh@fordham.edu

fordham.edu/fcc

FORSYTH TECHNICAL COMMUNITY COLLEGE

FTCC cybersecurity workshops

Forsyth Tech has been serving the citizens of Forsyth and Stokes counties since 1960. It began as the Winston-Salem/Forsyth County Industrial Education Center, offering vocational instruction and training in skilled trades. Today, as Forsyth Technical Community College, we expanded to offer college transfer and two-year degree programs, corporate training, continuing education, and personal enrichment classes.

Forsyth Technical Community College provides students with guided pathways into a competitive workforce for the community and global economy. The Cyber Security Center is committed to improving the practice of protecting information and training individuals in security concepts. The center establishes partnerships, supports information security research, assists development and sharing of resources, and performs the following:

• The college will seek to establish and foster partnerships with industry, educational institutions, and professional organizations.
• The college will support research efforts in cybersecurity and information security as well as any new cyber initiative.
• The college will use various methods to develop and distribute resources to facilitate improved cybersecurity and information security.

Under its K-12 Cyber Outreach Initiative, Forsyth Tech provides leadership to advance cyber defense education among K-12 students and instructors in the Eastern Region by providing industry tours for high school students to North Carolina Department of Technology's Eastern Data Center and local businesses. FTCC partners with local Girl Scouts to design cybersecurity badge training for elementary, middle, and high school students, and promotes cybersecurity awareness, secure robotics, and building websites.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Dr. Deanne Cranford-Wesley
(336) 734-7305
dwesley@forsythtech.edu

bit.ly/2VFMjrh

FTCC Center of Academic Excellence

Franklin University was founded in 1902 in Columbus, Ohio

For more than 115 years, **Franklin University** has been the place where adult learners can complete their degrees faster. From our Main Campus in downtown Columbus, Ohio, to our convenient online classes, this is the place where working adults learn, prepare, and achieve.

Franklin University is the only four-year, private institution in Ohio to hold the CAE-CD designation. Our transfer-friendly, online B.S. Cybersecurity program is especially popular with over 230 community and technical college partners. Franklin works with partner colleges both in our region and nationally to ensure that cybersecurity students have a direct pathway to finish a four-year degree and jump into their cybersecurity career.

The cybersecurity program is led by faculty who are both thought leaders and practitioners. They partner with an advisory board of business and industry leaders who provide guidance on theory-to-practice ideas, global business perspectives, and emerging topics. Students benefit from Franklin University's reputation for excellence in curriculum and course development that create learning experiences to address prevailing security concerns within industries and communities. Students also receive real-world experience as they work with local businesses to prepare security plans, assess risk, penetration test, run vulnerability scans, and assist with current security needs.

Franklin's Center for Public Safety and Cybersecurity Education engages both students and community members in cybersecurity education, with many community-facing events during the school year. As the Center seeks to expand cybersecurity education, we've created workshops for small businesses, online microcredentials such as a Certificate in Cloud Security, and partnered with CompTIA to provide real-world certifications to our students.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Franklin University
(877) 341-6300
admissions@franklin.edu

franklin.edu

Jaylan Abdalla, a Cybersecurity student at Franklin University, talks to local high school students about cybersecurity education and career opportunities.

GEORGE MASON UNIVERSITY

GMU Campus

Located near Washington, DC, **George Mason University (GMU)** has grown rapidly over the past half-century and is recognized for its innovation and entrepreneurship, remarkable diversity, and commitment to accessibility. As Virginia's largest public research university, GMU enrolls 37,000 students from 130 countries and all 50 states. GMU's graduates lead all public universities in Virginia with the highest starting salaries, and 80 percent of GMU degree earners are employed within six months of graduation, making GMU rank among the top 100 universities for best value. In 2016, GMU was named a Tier 1 research university, the highest designation from the Carnegie Classification of Institutions of Higher Education. The driving forces behind research at GMU are to solve real-world problems and to serve as an engine of innovation for the region and state. Some of GMU's most notable research includes developing new techniques and algorithms to secure the cyberspace.

George Mason University is one of the National Security Agency's original seven Centers of Academic Excellence in Information Assurance Education. GMU currently holds the designation of a National Center of Academic Excellence in both Cyber Defense Education and Cyber Research through 2021. The Center for Secure Information Systems was established in 1990 as the first academic center in security at a US university and leads cyber defense research at GMU. GMU's academic programs include a BS in Information Technology, with concentration in Information Security, and a BS in Cyber Security Engineering.

DESIGNATIONS

• CAE - Cyber Defense Education
• CAE - Cyber Defense Research

CONTACT INFORMATION

Massimiliano Albanese
(703) 993-1629
malbanes@gmu.edu

csis.gmu.edu

CSIS faculty members Kun Sun, Sushil Jajodia, and Massimiliano Albanese

THE GEORGE WASHINGTON UNIVERSITY

GWU CyberCorp graduates panel discussion

One of the most successful feeder institutions into the federal cybersecurity workforce pipeline, educating and sending computer security experts into government service since 2004, is **The George Washington University (GW)**, with its Partnership in Securing Cyberspace through Education and Service (Project PISCES). Through its Cyber Security and Privacy Research Institute (CSPRI), GW is a Center of Academic Excellence in Cyber Defense Research (CAE-R), focusing on research areas in cryptography, secure elections, mobile security, related AI, and social implications of cybersecurity.

GW provides education opportunities for students with diverse backgrounds to become cybersecurity professionals and help protect the safety and security of our nation's information infrastructure. We do this by combining scholarships, community college student access, university coursework across disciplines, internships, laboratories, and government service. The unifying and reinforcing Signature Seminar uses current practitioners and recognized leaders in cybersecurity to inspire and motivate our CyberCorps® students. It prepares them with the knowledge, perspective, and expertise to perform well in their future government positions, repay their obligation as scholarship recipients, and serve their country. Our multidisciplinary academic program in cybersecurity and our location five blocks from the White House and a few miles from hundreds of government agencies combine to make GW's CyberCorps® program attractive for students and for the government. Our very high placement rate for CyberCorps® graduates reflects that fact, as does our success in recruiting and graduating higher than average numbers of women in the field.

DESIGNATIONS

• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Shelly Heller
(202) 994-5906
sheller@gwu.edu

cspri.seas.gwu.edu

GWU CyberCorps Graduates 2018

![Grand Canyon University logo]

GRAND CANYON UNIVERSITY

Main Entrance to Grand Canyon University

Grand Canyon University is a private Christian university located in Phoenix, Arizona. The Bachelor of Science in Information Technology with an emphasis in Cybersecurity prepares graduates to confidently work in IT and cybersecurity fields. Students in this program study, design, develop, and support infrastructure to secure, share, save and utilize information in an organization. The program emphasizes cyber forensics, ethical hacking, and the acquisition of practical application skills for security architectures. The combination of learning IT and cybersecurity ensures that graduates from this program are able to support and design systems that are safe from cyber attacks.

The program consists of combined lecture and lab courses to ensure theoretical knowledge guides practical application. Virtualization technology is used to create enterprise-level IT infrastructures, providing students with a real-world environment to build, configure, manage, maintain, and secure cutting-edge technologies.

Students in the program also have the unique opportunity to participate in the Cyber Center of Excellence (CCE), a live-fire security environment led by industry-expert faculty. With over 40 workstations, hundreds of vulnerable targets, exchangeable hardware, software, a test prep center, and a library hosting the most current, relevant information, the CCE provides what no other Arizona institution has to offer; an ethical, hands-on playground for defensive learning. The CCE hosts both the IxT (Information times Technology) student group and the Order of the Sword and Shield, GCU's IT and cybersecurity honor society. By participating in CCE events, the students enhance their hands-on skills in critical thinking and problem solving.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Heather Monthie
(602) 639-8718
heather.monthie@gcu.edu

gcu.edu

GCU's cutting-edge IT facilities give students many opportunities for hands-on learning both in and out of the classroom.

GREAT FALLS COLLEGE
MONTANA STATE UNIVERSITY

Great Falls College Montana State University Campus

Great Falls College Montana State University is a two-year institution located in Great Falls, Montana. In 2019, it was designated as a Center of Academic Excellence in Cyber Defense Education for its Associate of Applied Science (AAS) in Network Support and Security degree. The degree is one of five computer technology degrees available through the college, including a Certificate of Technical Studies (CTS) in Cybersecurity for those already working in the computer industry who want to add to their skills and an AAS in Cybersecurity for those just entering the field. Outcomes for these programs are based on the National Institute for Cybersecurity Education (NICE) framework. An added bonus for students - they can complete the CTS in Cybersecurity and an AAS in Programming completely online.

At Great Falls College MSU, students have a lot of opportunities. They can earn industry credentials such as CCNP, MCSA, CompTIA Network+, CompTIA PenTest+, and CCNA Security. Because of a collaborative working relationship with the military and local community industry partners, students have access to up-to-date training, which includes hands-on experiences and collaborative projects to simulate the workplace and culminates with an internship or capstone project. On campus, students are able to participate in a Cyber Club, mentor high school and middle school students, and participate in cyber competitions. Of course, none of this would be possible without a strong faculty committed to teaching with backgrounds in government, military, finance and healthcare to distinguish the program.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Steve Robinett
steven.robinett@gfcmsu.edu

gfcmsu.edu

Students practice protecting networks

GREEN RIVER COLLEGE

GRC Instructor

Green River College's AAS-T in IT Systems and Security program prepares students for entry-level employment in a variety of IT positions such as help desk technician, technical support specialist, network technician, and network or computer systems administrator. Students receive foundational training in a broad range of networking, systems administration, and software development, resulting in a well-rounded knowledge of information technology.

Currently, the AAS-T IT program has over 400 students enrolled in classes. During the second year of the program, students are able to choose between a focus on Software Development or Network Administration and Security. Individuals who graduate from the AAS-T program are able to continue their education at Green River College with a Bachelor of Applied Science Degree in either Network Administration and Security or Software Development.

Students interested in the AAS-T program can complete classes on campus, in the evenings, or fully online. Classes are offered year round with the option for students to start any quarter. Funding is available through generous college foundation scholarships, financial aid, and worker retraining if applicable.

With over 400 AAS-T students, more than 300 BAS students, and 11 full time faculty to help guide them through the learning process, Green River College is excelling at training IT professionals that are prepared to start work immediately after graduation.

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

Alan Carter
(253) 833-9111 ext. 4630
acarter@greenriver.edu

greenriver.edu/cybersecurity

GRC Cybersecurity Student

![Hampton University Campus]

Hampton University Campus

The Information Assurance and Cybersecurity Center at Hampton University (IAC@HU) is a multidisciplinary center devoted to information assurance, education, research, and training. The center provides program and curriculum development, workshops, multidisciplinary research opportunities, outreach to other HBCU/MI's and community colleges, and access to information assurance and cybersecurity research resources. As part of the Center, the Information Assurance and Cybersecurity Lab (IA lab), located in the Computer Science Department, provides an isolated networked computer environment suitable for information assurance and computer security education, research, and training.

The goals of the IAC@HU include:

• Providing students with educational opportunities in information assurance and computer security
• Providing an information assurance and computer security research environment for faculty, staff, and students
• Providing information assurance and computer security resources not only within the University, but also to the local community, including law enforcement, government, business, and the public
• Providing opportunities for enriching information assurance education across the curriculum

The IAC@HU is designated as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) by the Department of Homeland Security (DHS) and National Security Agency (NSA) through 2021.

The information assurance and cybersecurity topics are integrated into the undergraduate curriculums offered within the Department of Computer Science: Computer Science (CSC), Computer Information Systems (CIS), and Cybersecurity – Computer Science track (CYS). These curriculums reflect existing advanced technology and provide Hampton University students with knowledge of state-of-the-art computer security and information assurance technology. Information assurance and cybersecurity is one of the most important areas in information technology, computing and general high technology areas. All three undergraduate curricular (B.S. in Computer Science, Computer Information Systems and Cyber Security – Computer Science) meet the Center of Academic Excellence in Cyber Defense Education (CAE-CDE). Students completed the CAE-CDE course requirements will receive a certificate of completion.

DESIGNATIONS

• **CAE–Cyber Defense Education**

CONTACT INFORMATION

Dr. Chutima Boonthum-Denecke
(757) 727-5082
chutima.boothum@hamptonu.edu

iac.science.hamptonu.edu

Highline College campus

Highline College is proud to be a CAE-CD with two of its programs – Digital Forensics & Investigations AAS and Network Security Engineer AAS mapped to the KUs. Highline was one of the community colleges who originally mapped to the 4011 and 4013e. Once the KUs were established, Highline remapped to those earning a re-designation for six years.

The CIS / Computer Science department has had a networking degree since the late 1990s. By 2003, the department added Network Intrusion Detection along with Data Recovery and Forensics (now known as Digital Forensics). The introduction of the Bachelor of Applied Science in Cybersecurity and Forensics shows the dedication not only of the department but of the institution to the program by becoming the first BAS offered at Highline to be

approved by the WA State Board of Community and Technical Colleges.

The institutional support and that of the IT Staff is further shown in that Highline has hosted the Pacific Rim Collegiate Cyber Competition (PRCCDC) for over a decade. Since 2016, the Highline AAS and BAS students have been a part of the build team for this annual event. They also support and run the International Collegiate Cyber Defense Invitational (ICCDI). Our students also compete in the DoE Cyberforce Competition™ ranking 10th in the November 2018 event.

Highline is the oldest college in King County, WA now in its 57th year. It is also the fifth most diverse college in the United States with over 80 languages spoken here.

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

Dr. Amelia Phillips
(206) 592-3497
aphillips@highline.edu

cis.highline.edu/cae

ICCDI Student Designers

Hill College Hill County Campus

The mission of **Hill College** is to provide high quality comprehensive educational programs and services. The college enhances the educational, cultural, and economic development of its service area and assists both individuals and the community to prepare for a more productive life. Hill College has a long-standing tradition of quality and comprehensive technical education programs. With 28 school district partners, the college can promote cybersecurity awareness, course offerings, curriculum sharing, and professional development.

Hill College is designated as a National Center of Academic Excellence in Cyber Defense Education for its Associate of Applied Science (AAS) in Computer Science, Networking Cybersecurity. The curriculum path includes the completion of stackable certificates leading to the AAS. Computer Science - Technical Core Certificate of Completion, Computer Science - Networking Cybersecurity Certificate of Technology, and Networking Cybersecurity AAS prepares students to complete nationally recognized industry certification exams such as Microsoft's networking administration, CompTIA A+, Security+, and Network+. Through these partnerships, discounted exam vouchers are provided to students.

As a member of the North Texas Community College Consortium, students enjoy seamless transitions from the AAS to four-year institutions. Hill College has university partnerships with 15 colleges, providing avenues for collaboration with the cybersecurity program.

We are proud to partner with industry leaders ensuring students obtain marketable skills needed for successful technical careers. The Computer Science department works closely with Workforce Education, providing corporate training utilizing the Texas Workforce Skills Development Grant and The Texas Workforce Commission's Small Business Grant.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Jeffie "Jackie" Armstrong
(254) 659-7950
jac@hillcollege.edu

hillcollege.edu

Jackie Armstrong, Hill College CAE Liaison

HONOLULU COMMUNITY COLLEGE

HCC CSNT students

The core cyber defense education program at **Honolulu Community College (HCC)** is the Computing, Security, and Networking Technology (CSNT) Program. Previously known as the Computing, Security, Electronics, and Technology (CENT) Program, the new name reflects the focus of the program and becomes official starting in the fall of 2019 at HCC.

The CSNT program provides students with extensive hands-on training in information and communication technology. Most courses include a laboratory component where students gain experience configuring and managing physical and/or virtual systems located in the classrooms or the CSNT datacenter. The embedded Certificate of Achievement (CA) in Information Assurance (IA) is built on the Knowledge Unit (KU) requirements for a collegiate institution to be recognized as a CAE-2Y. The program supports industry recognized certifications including A+, LINUX+, Security+, CCNA, and MCP.

The CSNT program also offers third year courses that articulate to the Bachelor of Applied Science in Information Security Assurance at the University of Hawaii at West Oʻahu. Non-credit education course offerings at HCC are supported by the Pacific Center for Advanced Technology Training (PCATT). PCATT offers an extensive selection of cybersecurity related courses for industry professionals looking to upgrade their skills or learn new skills. Cybersecurity related courses offered include, Security+, CISSP, CEH, CCNA Security, MCSE, and much more. PCATT also offers customized training to meet the needs of your organization.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Aaron Tanaka
(808) 845-9109
tanaka@hawaii.edu

Beryl Morimoto
(808) 845-9464
beryl.morimoto@hawaii.edu

honolulu.hawaii.edu/cybersecurity
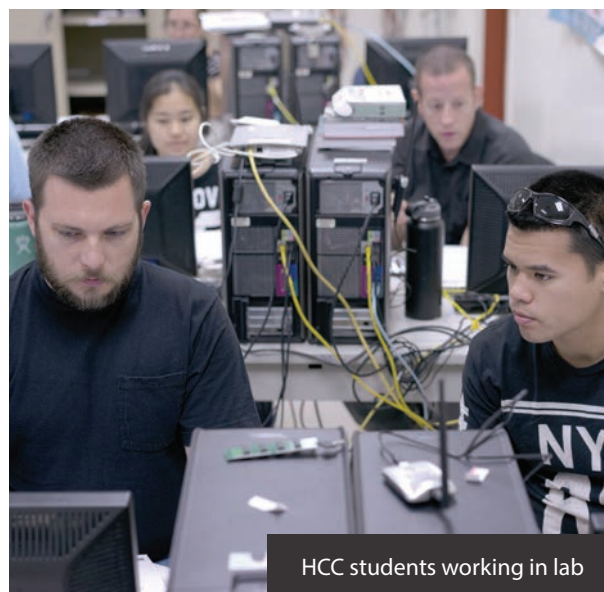
HCC students working in lab

HOUSTON COMMUNITY COLLEGE

Houston Community College campus

Houston Community College (HCC) is composed of 15 Centers of Excellence and numerous satellite centers that serve the diverse communities in the Greater Houston area by preparing individuals to live and work in an increasingly international and technological society. HCC is one of the country's largest singly accredited, open admission community colleges offering associate degrees, certificates, workforce training, and lifelong learning opportunities.

HCC established a Cybersecurity center under the HCC Digital and Information Technology Center of Excellence. HCC is committed to excellence in Cybersecurity and Cyber Defense education. The Houston Community College Cyber Center's goal is to provide cybersecurity education, information, and awareness to our community.
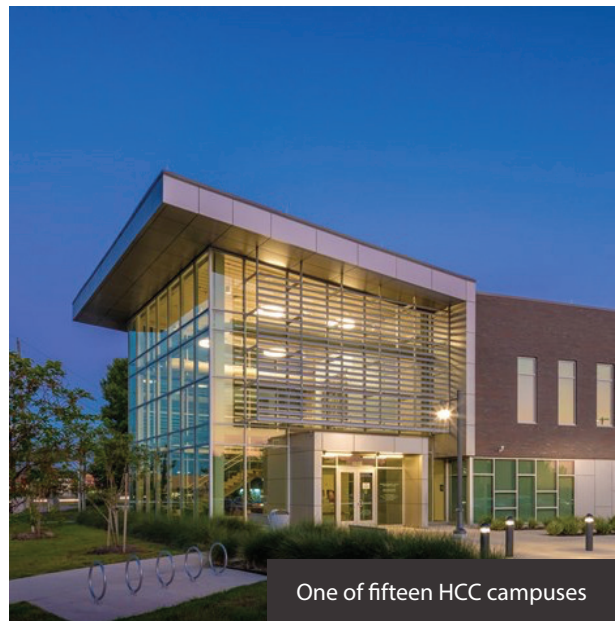
One of fifteen HCC campuses

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

Douglas "Scott" Hillman
(713) 718-6465
Scott.hillman@hccs.edu

hccs.edu/cybersecurity

HCC being awarded the CAE-2Y designation

HOWARD COMMUNITY COLLEGE

HCC Campus

Howard Community College (HCC), located in Columbia, Maryland, has been helping students achieve their academic goals since 1970. As a designated National Center of Academic Excellence (CAE-2Y) in Cybersecurity since 2012, HCC is the right choice for a rigorous and nationally-recognized cyber technology education. With the CAE Knowledge Units (KUs) mapped to the associate degree and the certificate program courses, HCC aims to produce a task force capable of defending against the increasingly complex nature of cybercrime and intrusion in both government and industry. The cybersecurity courses are mapped not only to CAE KUs of NSA and DHS, but also to proprietary industry exam certifications such as CompTIA Net+, Security+, CCNA and EC-Council Certified Ethical Hacker (CEH).

Students benefit from industry partnerships and resources for experiential learning, opportunities for extracurricular and cyber competitions, and the expertise of experienced faculty and practicing professionals.

HCC's Science, Engineering, and Technology Building houses state-of-the-art technology and facilities with hands-on lab instruction. HCC cybersecurity graduates may take advantage of HCC's transfer agreements and continue to 4-year programs or enter the workforce. Possible career paths include entry to intermediate industry positions, such as security specialist, information security specialist, network administrator, and computer forensics investigator.

In addition to the HCC certificate of proficiency and/or A.A. degree, students may request a certificate that is awarded from the division.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Mengistu Ayane
(443) 518-4471
mayane@howardcc.edu

howardcc.edu/cyber

Idaho State University

ISU Lower Campus

Idaho State University (ISU) located in Pocatello, Idaho, is designated as a Center of Academic Excellence in Cyber Defense Education and continues to be a leader in cybersecurity.

The Industrial Cybersecurity Engineering Technology program prepares students to secure the systems that control power plants, oil and gas pipelines, and manufacturing facilities. The Information Assurance program (IAP) defines new directions and leads students to the beginning of a life-long learning process that helps them continue to define the future. The IAP program emphasizes information systems and security skills in organizations and many technical disciplines. Graduates from the IAP are information systems professionals with a broad spectrum of both technical and managerial skills.

Our emphasis is on policy and procedure as well as training, education, and people issues. A recently added Masters of Science in Computer Science and new faculty enhances this program. ISU continues with outreach to the intermountain area through:

• Cyber range competitions
• Public media broadcasts
• K-12 classroom lectures
• Radio podcasts
• Regional and student newspaper editorials
• Journal publications
• ACM club meetings
• Poster sessions in the ISU SUB
• Awareness broadcast on the ISU broadcast system

As one of the original seven CAE programs, we continue to attract qualified students to enter the federal government through superior education, training, and awareness in cybersecurity for Idaho, the intermountain west, and the Nation.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Corey D. Schou
(208) 282-3194
schocore@isu.edu

niatec.iri.isu.edu

ISU SFS Job Fair

ILLINOIS INSTITUTE OF TECHNOLOGY

IIT Campus

Illinois Institute of Technology (IIT) is world renowned for research and education in engineering, architecture, law, and design, and has now brought this same focused, real-world educational quality to cybersecurity. The only university in Illinois to earn ABET accreditation in information technology (IT), Illinois Tech's Department of Information Technology and Management now offers a Bachelor of Science in cybersecurity and IT in a curriculum designed to be accredited in both areas. The Master of Science in cybersecurity and digital forensics provides expanded opportunities for research, and the professional Masters' in the field is not only available at the Chicago campus but can be completed entirely online. Students, faculty, and practitioners have an opportunity to present research at Illinois Tech's annual ForenSecure, a regional Chicago-area cybersecurity and digital forensics conference now in it's 17th year.

Illinois Tech cybersecurity education and ForenSecure are supported by the Center for Cyber Security and Forensics Education (C2SAFE) and the School of Applied Technology Forensics and Security Laboratory (ForSec Lab). C2SAFE is a collaborative space where business, government, academia, and security professionals intersect. The ForSec Lab hosts live lab facilities with multiple state-of-the-art workstations and is home to the Remotely-Accessible Dynamic Infrastructure for Students to Hack (RADISH) allowing students to have full access to lab resources from any location and from nearly any internet-connected device.

Illinois Institute of Technology offers quality, comprehensive cybersecurity education with significant depth and breadth in one of the world's great cities, opening tremendous opportunities for both students and faculty.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Maurice E. Dawson
(312) 567-5242
mdawson2@iit.edu

appliedtech.iit.edu/c2safe

Director, Center for Cyber Security and Forensics Education Maurice Dawson

ILLINOIS STATE UNIVERSITY

ISU Campus

Illinois State University (ISU), founded in 1857, is the oldest public university in Illinois. Illinois State is a co-educational, residential university that offers 160+ degree programs to approximately 18,100 undergraduate students and 100+ graduate programs to about 2600 students. Illinois State works as a diverse community of scholars, educators, and staff to support our commitment to fostering a small-college atmosphere with large-university opportunities. Housed in the School of Information Technology, the Cybersecurity program at Illinois State is the first of its kind in the state and home to 300 undergraduate majors. Our program has been designated as a Center of Academic Excellence in Cyber Defense Education by the department of Homeland Security and National Security Agency since 2014.

Coursework in Cybersecurity significantly emphasizes hands-on learning for both defensive and offensive aspects of the curriculum. The school has invested heavily in virtual lab environments, allowing students to work on practical aspects of Cybersecurity from anywhere with an Internet connection. A state-of-the-art Cybersecurity lab is currently under construction with a recent $3M gift from State Farm Corporation and will significantly enhance our students' experience. Our relatively small class sizes offer students personal interaction with the faculty who are active researchers in a variety of fields in computer and network security. Our faculty enjoy the chance to work with students in undergraduate research and independent studies. The ISU security club offers students extracurricular opportunities via student led projects, and students in the club actively participate in cyber defense competitions. The school also hosts an annual high school cyber defense competition which has been well received in the Central Illinois region.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Traci Carte
(309) 438-8338
tacart3@IllinoisState.edu

it.illinoisstate.edu

ISU Cybersecurity Students

INDIAN RIVER STATE COLLEGE

IRSC Campus

As a leader in education and innovation, **Indian River State College (IRSC)** transforms lives by offering high-quality, affordable, and accessible education through traditional and online delivery.

The Cyber Center of Excellence (CCoE) at IRSC was formed in 2015 and received the Center of Academic Excellence in Cyber Defense designation from the NSA and DHS in 2018. Our core mission is to:

Deliver instructional excellence to students to help provide the InfoSec workforce with properly prepared cybersecurity professionals
Strengthen and establish partnerships within the community to provide cybersecurity education, training, and student-led services
Facilitate cybersecurity related training within every program and degree offered to elevate general cybersecurity knowledge across all disciplines

Continue to develop and expand our visibility throughout our local K-12 educational facilities to enhance cybersecurity education and awareness

The Cyber Center of Excellence at IRSC brings together nearly a dozen computer science faculty with expertise in ethical hacking, digital forensics, network engineering, data analysis, machine learning, and secure programming. By combining cutting-edge labs with exceptional instruction in an engaging environment, our students are prepared to solve real-world security issues. Our industry certification voucher program enables students to achieve certifications from entities such as CompTIA, Microsoft, EC-Council, Cisco, and Offensive Security at no cost. IRSC's Advanced Technology Center offers multiple labs for students to get hands-on with the latest hardware and software technologies in a relaxed and fully staffed environment. Students may choose from online, in-person, or blended classes to fit their schedules, and 91% of our students graduate debt free.

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

Steve Nicholson
(772) 462-7145
snichols@irsc.edu

irscccoe.org

IRSC Cyber Classroom

INDIANA UNIVERSITY
BICENTENNIAL
1820–2020

IU Bloomington Campus

Indiana University (IU) is a National Center of Academic Excellence in Cyber Defense for both education and research. IU is a leader in addressing difficult cybersecurity challenges through our unique operational services, academic programs, and cybersecurity and scholarly research.

IU conducts broad scholarly research to investigate emerging trends and issues. Our research portfolio includes the Luddy School of Informatics, Computing, and Engineering which explores technology's role in society to help design better systems, Security and Privacy in Informatics, Computing, and Engineering (SPICE), and the Ostrom Workshop. IU is also home to Big Red 200 – an HP Cray Shasta supercomputer supporting AI/cybersecurity research.

IU provides multiple avenues of study for those interested in cybersecurity. These avenues include digital badges, executive education, undergraduate programs, and graduate degrees from the Luddy School of Informatics, Computing, and Engineering, the Hamilton Lugar School of International Studies, the Kelley School of Business, the Maurer School of Law, and unique interdisciplinary degrees and programs.

IU leads nationally recognized services addressing the unique needs of research and education. The GlobalNOC has been building and supporting national, international, and regional R&E networks for almost 20 years. IU leads the OmniSOC, a shared cybersecurity operations center service for higher education. IU's Center for Applied Cybersecurity Research (CACR) leads the National Science Foundation's Cybersecurity Center of Excellence (Trusted CI) and the NSF-sponsored ResearchSOC. IU also leads the Research and Education Networks Information Sharing and Analysis Center (REN-ISAC) that promotes cybersecurity operational protections and response.

DESIGNATIONS

- **CAE – Cyber Defense Education**
- **CAE – Cyber Defense Research**

CONTACT INFORMATION

Scott Orr
smorr@iu.edu

leading.iu.edu

Luddy Hall

INDIANA UNIVERSITY OF PENNSYLVANIA

IUP Campus

For almost two decades, **Indiana University of Pennsylvania (IUP)** has been a leader in cybersecurity education and encouraged the growth of professionals in the field. The B.S. in Computer Science/Cybersecurity track was first offered in 2002. This new degree program combined core computer science and cybersecurity classes with a minor in criminology, creating a novel curriculum that helped students gain a broad understanding of the field and be work-ready. A minor in cybersecurity was also added in 2002 and continues to offer students in all disciplines a better understanding of cybersecurity. IUP is one of the first institutions in the nation to receive designation by the National Security Agency (NSA) as a Center of Academic Excellence and has held this designation for almost two decades. In 2005, IUP founded the **Institute for Cybersecurity (ICS)** to further encourage and promote cybersecurity at IUP and the surrounding community.

In the years since its creation, the ICS has established unique and high-quality cybersecurity programs, fostered strong faculty research and teaching expertise, and provided unprecedented cybersecurity learning opportunities, including the annual Cybersecurity Days, weekend workshops and summer camps open to all students and teachers in the local community. Recently, IUP's cybersecurity program has experienced record student enrollment, unprecedented flow of federal awarded grants from DoD and NSA/NSF, and the launch of many novel initiatives (GenCyber, Expansion of CAE-C Education, and DoD CySP) that not only improve our programs but also enhance cybersecurity research and education in the entire western Pennsylvania region.

DESIGNATIONS

• **CAE-Cyber Defense Education**

CONTACT INFORMATION

Dr. Waleed Farag
(724) 357-7995
farag@iup.edu

iup.edu/cybersecurity

Students attending the Cybersecurity Knowledge and Skills Enhancement Camp at IUP

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Iowa State University, the land-grant and largest educational institution in Iowa, is nationally known for its commitment to the student adventure and finding solutions to tomorrow's challenges

Considered a trailblazer in information assurance education, **Iowa State University** in Ames, Iowa, boasts a keen eye for delivering programs that enhance its students' marketability in the everchanging world of cybersecurity.

As one of the original seven charter schools honored to become members in the Center of Academic Excellence in Information Assurance Education, Iowa State has developed one of the largest educational and research programs in the nation. Students were attracted to Iowa State more than 20 years ago for a graduate degree in the field and today, the university offers more than a dozen courses in cybersecurity and is poised to offer a new bachelor's degree in cybersecurity engineering in fall, 2019. The Information Assurance Center was created in 2000 and has become nationally recognized for its

multidisciplinary research, teaching and outreach.

The university is also nationally known for its Cyber Defense Competitions that pit the industry's very best against some of the most talented students across the Midwest. More than 6,000 participants have attended the 55 CDCs. More than 1,000 Iowa State alumni participated in one or more Cyber Defense Competitions as students, attracting attention from international companies seeking fresh talent with real-world security experience.

The 160-year-old land-grant university has extending education opportunities to middle school and high school students through its creation of security literacy modules for teachers to use in their classrooms.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Doug Jacobson
(515) 294-8307
dougj@iastate.edu

iac.iastate.edu

Iowa State University pioneered cyber defense learner competitions. Today, students from high schools and colleges from across the nation use university facilities for competitions held five times a year

Ivy Tech Campus

Ivy Tech Community College created the Center for Cyber Security to meet the demands for high-quality cybersecurity education and training. Through our nationally recognized center, Ivy Tech students receive the education and training they need for jobs that secure our community, state, and the Nation's computers, networks, and critical infrastructure.

The program will build the foundation to detect and fix computer security attacks. Cybersecurity is a degree that can be applied to many facets of the student's life, from personal to work experiences. We offer certificates, technical certificates, Associate of Science (AS), and Associate of Applied Science (AAS). Our cyber curriculum provides students with hands-on skills required for security infrastructures, data, and devices. There are also opportunities for internships and externships to increase student competency in cybersecurity in real world situations.

Ivy Tech's partnership with the Indiana National Guard and the National Center for Complex Operations (NCCO) offers Cyber Academy - an 11-month AAS cybersecurity program that helps meet ever increasing cyber workforce demand. The program is hosted at the Muscatatuck Urban Training Center (MUTC) in Butlerville, Indiana. MUTC is home to the Department of Defense's largest urban training complex, a real city where virtually everything and everyone is in play. The physical infrastructure includes a well-integrated and managed cyber-physical environment, known as CyberTropolis, an electromagnetic effects system with real people living and working on the campus.

The quality of programs at Ivy Tech is recognized by several governmental entities, attesting to the quality of the curriculum, instruction, and administrative support.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Jiri Jirik
(812) 492-0325
jjirik@ivytech.edu

ivytech.edu/evansville

Cybersecurity Competition at Ivy Tech

JACKSON STATE COMMUNITY COLLEGE

JSCC cyber students

Jackson State Community College (JSCC) was the first community college in Tennessee to receive the CAE-2Y designation. JSCC was also the first institution to offer an Associate of Applied Science (AAS) degree in cybersecurity in Tennessee. JSCC was the lead institution in Tennessee to develop a statewide Cyber Defense concentration under the Computer Information Technology A.A.S. degree program. Over the past 15 years, JSCC has offered more than 25 cybersecurity related faculty development workshops for community college faculty across the State of Tennessee as part of the Cyber Security Education Consortium (CSEC). The college has also partnered with the University of Memphis on several projects including the National Science Foundation grant-funded Puzzle-Based Learning Project. The project produced multiple game-like cybersecurity puzzles that were made available for public access to be used in high school, community college, and university cybersecurity classrooms.

JSCC continues to provide access to cybersecurity resources through its Cyber Security Center website. The JSCC Cyber Security Center provides cyber defense and networking program information, general information about cyber defense/security, links to valuable cybersecurity education and training materials, and provides an avenue to promote collaboration and interaction between students, faculty, and the community. The College partners with several government agencies to strengthen its cybersecurity educational presence in Tennessee. JSCC is always available to assist other community colleges in the development of their cybersecurity programs.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Thomas L. Pigg
(731) 424-3520 Ext. 50201
tpigg@jscc.edu

jscc.edu/academics/divisions/cis
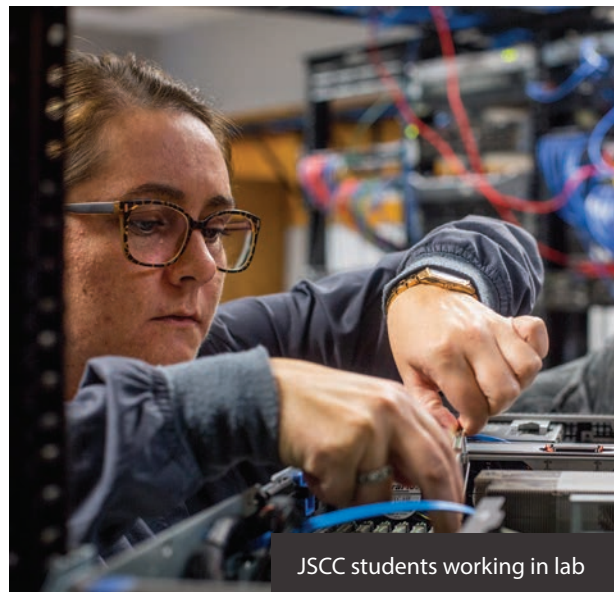
JSCC students working in lab

JACKSONVILLE STATE UNIVERSITY

Jacksonville State University, Jacksonville, Alabama

Jacksonville State University (JSU) is a public, comprehensive university serving northeast Alabama, since 1883. The university offers three programs in cybersecurity: BS in Computer Science with a concentration in Information Assurance, BS in Computer Information Systems with a concentration in Information Assurance, and MS in Computer Systems and Software Design with a concentration in Information Security and Assurance.

JSU has been a Center of Academic Excellence in Cyber Defense Education since 2014. Prior to receiving the designation, JSU established the Center for Information Security and Assurance (CISA) through the Mathematical, Computing, and Information Sciences (MCIS) department in 2008. The objective of CISA is to provide an avenue for research and education in computer and network security, digital forensics, cryptography, risk assessment and mitigation, disaster recovery and management, security regulations and compliance, and information security management.

The CISA resources include two cutting-edge laboratories equipped with networked desktop computers that are configured with multiple operating systems, such as Windows, Debian, and FreeBSD. Virtualization technology, including VMware and VirtualBox, has been in use for several years. Our faculty, with a diverse background from several departments across the campus, works closely with students to ensure their success. They provide both theoretical and hands-on training for students to learn through real experience and to increase their academic performance. Critical thinking, creativity, and innovation are promoted to help students to solve problems that arise in this ever-changing field. The university is also a Cisco Academy, Oracle Academy, and has agreements with Microsoft and LinkedIn Learning.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Eric Gamess
(256) 782-5452
egamess@jsu.edu

jsu.edu/mcis/cisa

Cocky - Go Gamecocks!

James Madison Campus

JAMES MADISON UNIVERSITY

James Madison University (JMU) is one of the original seven Centers of Academic Excellence in Information Assurance Education (now Cyber Defense) (CAE-CD). Since January 1997, JMU has been a leader in online Information Security education. Designed for working professionals, our highly-ranked program is one of the most comprehensive online Information Security Master's degree programs in the country and is part of the College of Integrated Science and Engineering. We are an innovative collection of applied STEM units, focused on connecting students to cutting-edge tools and technology as they focus on real-world problems.

Our Computer Science Department offers an undergraduate Information Security Certificate program. We combine our cybersecurity with co-curricular activities, including hackathons, programming competitions, and the Cyber Defense Club. We have also been active in the Hacking 4 Defense program. JMU also offers a Masters in Business Administration with an Information Security concentration, a Bachelor of Science in Intelligence Analysis and a new online graduate certificate program focusing on Cyber Intelligence. These programs are designed to address a variety of the information security needs of the nation.

Set in the beautiful Shenandoah Valley of Virginia, JMU is a tight-knit community of 22,000 undergraduate and graduate students and 3,000 faculty and staff who come from across the country and around the world. Only two hours from Washington D.C., JMU is fast becoming one of the nation's leading lights in higher education.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

M. Hossain Heydari
(540) 568-8745
heydarmh@jmu.edu

jmu.edu/infosec

100% Online

JOHN A. LOGAN COLLEGE

John A. Logan Campus

Information assurance is the common goal for security professionals, and is dependent upon confidentiality, integrity, and availability: the triad of security. This triad is the framework that the **John A. Logan College Center for Information Assurance** is built on. Our intent is to provide access to resources that will prepare prospective students, enrolled students, and alumni with current industry information.

We are a diverse learning and teaching community committed to improving individual life and society through high-quality, accessible educational programs and engaged learning opportunities. Our students are our mission and community development is supported by the school's staff, faculty, administration, and prominent members of our community. We are extremely proud of our students' involvement in building a more aware and

stronger community. JALC works with K-12 STEM/STEAM programs, Girl Scouts, Boy Scouts, boot camps, athletes, and parents by utilizing demonstrations and projects.

We are active at CAE events, virtual job fairs, training, and conferences. Our school favors conference experience for our students and have attended 3CS and WiCyS every year. The CCDC team and computer club have competed in Wicked6, NCL, and at Argonne National Laboratories. Students involved with our WiCyS chapter elect to put in extra work, internships, tutorials, labs, training, and volunteering in the community every year.

Earning the CAE designation has helped put our rural school in southern Illinois on the map. We have gathered resources, made allies, and improved our program through this effort and we proudly share our findings with other schools. JALC is proud to be a member and we hope to continue these progressive steps toward building a more secure future with our community and family.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Kylee Williams
(618) 985-2828 ext: 8462
kyleewilliams@jalc.edu

jalc.edu/cia

JALC Cyber Team

JHU Campus

The **Johns Hopkins University Information Security Institute (ISI)** is home to world-class interdisciplinary experts whose research is dedicated to protecting the nation's vast online systems, infrastructure, and data.

The institute's signature research area is scientific methods to improve the security of health care devices and systems, from electronic health care records to pacemakers and bedside infusion pumps. JJHUISI faculty members are leading a multi-university team advancing state-of-the-art health care security practices.

ISI researchers understand that secure systems rely on robust cryptographic protocols and are on the forefront of developing new applications that resist attacks.

They have:
• Uncovered security vulnerabilities in electronic voting machine software that could have allowed someone to cast multiple votes; most of today's voting machines incorporate paper ballots as a result
• Discovered that hackers could remotely disable the indicator light on MacBook webcams to record and spy on the user
• Exposed a security flaw in Apple's iMessage system that could have allowed hackers to decrypt messages, videos, and photos sent via that service

ISI also is focused on education. More than 100 students are enrolled in its Master of Science in Security Informatics program, which provides them with the technical foundation and knowledge needed to meet the nation's growing demand for highly skilled professionals.

DESIGNATIONS

• **CAE – Cyber Defense Research**
• **CAE – Cyber Defense Education**

CONTACT INFORMATION

(410) 516-6282
jhuisi-info@jhu.edu

engineering.jhu.edu
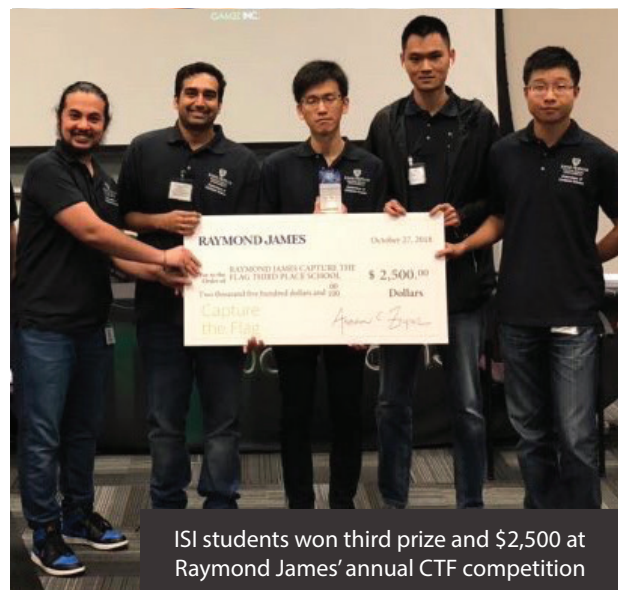
ISI students won third prize and $2,500 at Raymond James' annual CTF competition

JOHNSON COUNTY COMMUNITY COLLEGE

Johnson County Community College Campus

Johnson County Community College has been designated by the National Security Agency/Department of Homeland Security (NSA/DHS) as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) through the academic year 2024. The Johnson County Community College Information Technology/Networking program aims to be a local and national leader in cyber defense education.

The Associate of Applied Science degree in Information Technology at Johnson County Community College provides students with a foundation in designing, installing, implementing, and securing computer networking resources. Students train in a virtual work environment and collaborate with colleagues in fully equipped labs. Course requirements include network operations and product-specific requirements for Windows,

Linux, and Cisco. Our curriculum aligns with certification requirements for Microsoft Certified Solutions Associate (MCSA), Cisco Certified Network Associate (CCNA), Linux Professional Institute Certification (LPIC), CompTIA A+, CompTIA Security+, EC Council CHFI, and EC Council CEH. We also offer transfer options to four-year programs, where students can earn a Bachelor's Degree in Cybersecurity, IT Management, or other related fields.

In addition to our Associate of Applied Science degree in Information Technology, we offer a Cybersecurity Certificate that prepares students to step into the role of Security Analyst. Students learn the skills to protect computers, networks, and data from unauthorized access, change, or destruction. Upon completion, students have strong foundational skills in cyber defense, network security, ethical hacking, digital forensics, and scripting.

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

Andrew Lutz
(913) 469-8500 ext. 2213
alutz4@jccc.edu

jccc.edu
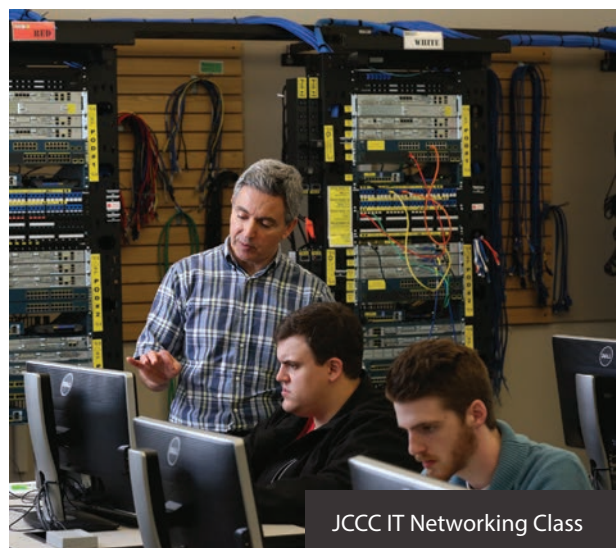
JCCC IT Networking Class

Willie the Wildcat outside the front office or the Department of Computer Science

The **Center for Information and Systems Assurance (CISA)** at **Kansas State University** has been designated as an NSA/DHS National Center of Academic Excellence in Cyber Defense Research since 2010. The mission of the Center for Information and Systems Assurance at Kansas State University is to conduct fundamental and applied research in information assurance and computer security, advance information assurance, cryptography, and forensics knowledge bases of our BS, MS, MSE, and PhD students, and engage the professional community in collaborative efforts that support the understanding, operation, and development of secure software systems that pervade our society.

CISA supports a broad, cutting-edge cybersecurity program within the department of computer science. There are eight core computer science faculty whose areas of focus and expertise lie in principles, mechanisms, architectures, assurance, operations, and analysis. CISA was instrumental in creating the new cybersecurity option for KSU's undergraduate computer science degree, which provides a structured path to security education as part of a comprehensive computer science curriculum. The option includes a capstone project based on the INSuRE program, which brings together universities and government organizations to solve timely, real-world security problems.

Kansas State also understands that the theory and practice of securing information and systems across the broad spectrum of computing systems, network systems, applications, and information storage is not just a computer science-specific endeavor, but touches on diverse areas of fundamental science and everyday practice — a broadly trans-disciplinary effort, with contributors from computer science, electrical and computer engineering, psychological sciences, physics, communication studies, sociology, anthropology, and social work.

DESIGNATIONS

• CAE – Cyber Defense Research

CONTACT INFORMATION

Dr. Eugene Vasserman
(785) 532-6350
eyv@ksu.edu

cisa.ksu.edu

Students training for a cyber defense competition.

KENNESAW STATE UNIVERSITY

Kennesaw State University, Kennesaw Campus

A leader in innovative teaching and learning, **Kennesaw State University** offers more than 150 undergraduate, graduate, and doctoral degrees to more than 35,000 students on two metro Atlanta campuses. A Carnegie-designated doctoral research institution (R2), Kennesaw State is one of the 50 largest public universities in the country. KSU's vibrant campus culture, diverse population, strong global ties, and entrepreneurial spirit draw students from throughout the region and from 92 countries across the globe.

Nationally recognized, internationally renowned, and home to a dedicated community of diverse students and educators, the Michael J. Coles College of Business leverages its passion for innovation to improve the lives of people everywhere. Nearly 20 percent of all KSU students are enrolled in Coles College degree programs.

KSU's Bachelor of Business Administration in Information Security and Assurance (BBA-ISA) creates technologically-proficient, business-savvy information security professionals capable of applying policy, training, and technology solutions to protect information assets from all aspects of threats and to manage the risks associated with modern information usage. In addition to the BBA-ISA, KSU offers an online BS, certificates and minors in ISA and cybersecurity.

Led by renowned textbook authors Dr. Michael Whitman and Dr. Herbert Mattord, KSU's Center for Information Security Education and Institute for Cybersecurity Workforce Development increase interest in cybersecurity education through hosting the annual Conference on Cybersecurity Education, Research and Practice; publishing the Journal of Cybersecurity Education, Research and Practice; and conducting the Southeast Collegiate Cyber Defense Competition.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Michael E. Whitman
(470) 578-3568
infosec@kennesaw.edu

infosec.kennesaw.edu
cyberinstitute.kennesaw.edu

Michael J. Coles College of Business

LAKE SUPERIOR COLLEGE

Lake Superior College, Duluth, Minnesota

Lake Superior College is the only two-year college in Minnesota designated as a National Center of Academic Excellence in Cyber Defense by the National Security Agency/Department of Homeland Security.

Located in Duluth, Minnesota, it is the largest two-year college in northern Minnesota with enrollment of approximately 10,000 students. It is a member of the Minnesota State system with 30 community and technical colleges and seven state universities.

The college's leadership role in cybersecurity education includes:
- A Network Administration and Cybersecurity A.A.S. degree that is available online or on campus
- A national ranking as one of top 25 best online Associate Degrees in Cybersecurity

- A national ranking in the top ten most affordable online Associate Degree in Cybersecurity
- A CyberCorps® Scholarship for Service with St. Cloud State University
- A Minnesota State Pathways transfer agreement with St. Cloud State University that allows LSC students to transfer and complete their bachelor's degree on the SCSU campus
- Free, summer cybersecurity camps that introduce high school students to the world of cybersecurity
- A $240,000 grant from the NSA for Cybersecurity Workforce Education Initiative built a training lab for students that simulates work environments
- A $98,938 grant from the U.S. Department of Education is helping train LSC cybersecurity students on the growing security risk offered by IoT (Internet of Things) devices

DESIGNATIONS

- **CAE – Cyber Defense Education**

CONTACT INFORMATION

Valarie "Vickie" McLain
(218) 733-7600
valarie.mclain@lsc.edu

lsc.edu

Advanced campers and coach at Lake Superior College's 2018 GenCyber camp

LCC West Campus houses the Cybersecurity/Tech Programs

Lansing Community College is one of the largest community colleges in Michigan, serving more than 23,000 students each year. It offers more than 200 associate degree and certificate programs in addition to career and workforce development and personal enrichment options. The college was founded in 1957 and has since grown from its flagship campus in downtown Lansing to include locations in Delta Township, East Lansing, Mason and Livingston County. LCC is consistently named one of Michigan's best community colleges, and students enjoy unsurpassed instruction, beautiful facilities, cutting-edge technology and comprehensive support services to help them succeed.

The rapidly expanding realm of cybersecurity offers a wealth of career options. Lansing Community College (LCC) associate degree and certificate programs are designed to help you gain the technical skills, knowledge, and expertise you need to unlock your potential and specialize in the cybersecurity field of your choice. We have developed our Networking and Cybersecurity degree in conjunction with employers both locally owned and state government to be relevant to your career growth. Our faculty lend their extensive field experience while an advisory board ensures that you are trained to the highest standard.

While at LCC, you will have an opportunity to participate in our National Chapter of the Cybersecurity Student Association and compete in ethical hacking competitions. You can also aid in our community cybersecurity hygiene and career awareness event via our Cybersecurity Outreach program through LCC's Center for Cybersecurity Education Center.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Jason Mitchell
(517) 483-1553
mitch24@lcc.edu

lcc.edu/community/cybersecurity

LCC Cybersecurity Course

Laredo College, Laredo, TX

Laredo College is nestled on the banks of the Rio Grande along the Texas-Mexican border. Founded in 1947, Laredo College is a two-campus district serving the diverse needs of a growing community. The College's Network & Cybersecurity Technology program spearheaded the efforts to achieve CAE-2Y designation in 2018. The Cybersecurity program is diverse and challenging, comprised of Microsoft Server, Cisco, Linux, Forensics, and Cyber Defense curricula. Program topics are dispersed over two stackable certificates culminating in an Associate of Applied Science degree. The program is also a Microsoft and Cisco Academy.

In Spring 2019, the program will launch a Cybersecurity Institute specializing in deep web studies and cyber defense research. The primary goal of the Institute is to produce a high skilled workforce capable of combatting all forms of cyber-attacks. A strictly controlled dark network will include firewalls, VPNs, and the latest in core and access layer cybersecurity technologies. The Institute will introduce and sponsor cybersecurity training programs and workshops to create more effective pedagogies for cybersecurity instruction at both the high school and college level. This highly innovative STEM educational pathway will produce highly skilled individuals who are trained in multiple cyber environments and will be better prepared for direct placement in the workforce.

Also envisioned for 2019 are the expansion of program instruction into UAS drone technology (to explore applications for border and crime scene surveillance), expansion into cyber operations, and creation of Enhanced Skills Certificates. All program enhancements are intended to better prepare program graduates and the community for successful workforce employment in cyber defense occupations.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Robert P. Moore
(956) 721-5317
rmoore@laredo.edu

laredo.edu/cms/CenterForCyberEducation

LEEWARD COMMUNITY COLLEGE

LCC Campus

Leeward Community College's Cybersecurity Center showcases a variety of cybersecurity related programs and resources available to students and faculty.

The core Cyber Defense program at Leeward CC is in the Information and Computer Science program (ICS). The ICS program provides students with a wide background in Information and Computer Science Including programming, networking, operating systems, and security fundamentals. Embedded in this program are Certificates of Achievement in Information Security, and Competence in Information Security. These certificates are built on the Knowledge Unit (KU) requirements for a collegiate institution to be recognized as a CAE-2Y. The program also features support for the following industry recognized certifications: A+, Network+, Security+, and Linux+.

In addition, our ICS program has an articulation agreement with the University of Hawai'i at West O'ahu (UHWO). Once Leeward CC ICS students receive their AS in ICS they can transfer to UHWO and complete the Bachelors of Applied Science in both IT and Information Security Assurance.

The ICS program provides students with an extensive amount of hands-on training. Courses are held in the classrooms that are supported and maintained by the campus. The classrooms provide students with computers and technical resources where the student gains experience programming computer applications, web applications, configuring and managing virtual systems and networking equipment such as routers, switches and firewalls. The ICS Program runs a datacenter which provides a virtual desktop infrastructure which is used to support the hands-on portion of various ICS courses.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Petersen Gross
(808) 455-0494
grossp@hawaii.edu

leeward.hawaii.edu/cybersecurity

LCC ICS Graduates

LOC Campus

LEMOYNE-OWEN COLLEGE

LeMoyne-Owen College is located within the urban center of Memphis, Tennessee, which yields a rich cultural vibrancy to the institution dating back to 1862. We are a launching pad for success, no matter where scholars are on their academic journey. In 2019, LeMoyne-Owen College was designated as a Center for Academic Excellence in Cyber Defense Education (CAE-CDE) by the National Security Agency and Department of Homeland Security. Through this designation, LeMoyne-Owen College offers a Bachelor of Science in Computer Science with a concentration in Information Assurance and Cyber Defense.

LeMoyne-Owen's Center of Cybersecurity is a partnership between the Criminal Justice, Computer Science, and Education programs. Each program offers a concentration in cybersecurity. With the establishment of a cyber defense degree, students have been exposed to digital forensics, cyber ethics and law, and many other aspects of cybersecurity. Students have opportunities to create applications, explore architectures, research virtual reality, study beginning robotics, and are given access to a 30-person lab where students study using industry available digital forensics tools.

As a Historically Black College/University, LeMoyne-Owen exposes underrepresented students to technology they would not normally experience. This center affords them the opportunity to explore a "what's possible" view of education and to increase their skills in the growing field of cyber defense. Graduates with LeMoyne-Owen College's cyber defense degree will be prepared for careers which address the escalating issue of cybersecurity.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Denise Ferebee
(901) 435-1391
denise_ferebee@loc.edu

loc.edu/academics/center-for-cybersecurity

LeMoyne-Owen Staff Receives CAE-CDE Certificate

Lewis University offers several distinctive opportunities for future information security specialists

Lewis University has been a Center of Academic Excellence since 2011, first in Information Assurance Education, and now in Cyber Defense. A mid-sized Catholic institution located about thirty miles southwest of Chicago, Lewis serves 6,500 students, about 10% of whom major in a program offered by the Department of Computer and Mathematical Sciences (CaMS) or Management Information Systems (MIS).

Through its Bachelor of Science in Computer Science, CaMS offers a Concentration in Cybersecurity, which gives students an in-depth understanding of how computers and networks function so that they can use existing tools and create new technologies for detecting, preventing, combating, and investigating cyberattack. CaMS also offers Concentrations in Digital Forensics and Networking through its Computer Science degree, as well as a Master of Science degree in Computer Science which offers comparable Concentrations in Cybersecurity and Digital Forensics. CaMS hosts the University's Cisco Networking Academy and award-winning Cyber Defense Club, which took first place at the 2018 Department of Energy Cyber Defense Competition.

MIS offers innovative programs in Information Security Management at both the undergraduate and graduate levels. Students from this program have competed in national competitions such as the Cyber 9/12 Strategy Challenge.

Students from both programs can take courses on campus or online through our CloudLab and NetLabs platforms. They also can minor in the other program for a truly comprehensive education in information security.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Faisal Abdullah
Chair of MIS
abdulfa@lewisu.edu

Ray Klump
Chair of CaMS
klumpra@lewisu.edu

cs.lewisu.edu

Lewis students won 2018 DOE CDC

LIBERTY UNIVERSITY

Liberty University Campus

Located in Central Virginia, **Liberty University (LU)** is a liberal arts institution with 17 colleges and schools and offers programs in fields such as education, counseling, religion, law, aviation, cinematic arts, business, and more.

Liberty's cybersecurity program emphasizes real-world experience, meeting and exceeding industry standards, and student success. With six programs in cybersecurity, including undergraduate and graduate, we prepare students for careers such as governance, risk management, compliance, technology, and secure development. Recognizing the importance of cybersecurity for both the public and private sectors, Liberty is committed to preparing cybersecurity experts, to increase cyber capabilities through novel research, and increase cyber awareness throughout the university and the surrounding community. To this end, the Liberty

University Center for Cyber Excellence (CCE) is established to formalize and coordinate these activities. The CCE serves as the focal point for cyber programs and provides extracurricular activities, including a Cyber Defense Club that participates in regional and international competitions.

Liberty has been designated as a National Center of Academic Excellence in Cyber Defense education since 2018. The School of Business at Liberty University is dedicated to building up Champions for Christ, emphasizing the character, ethics, and integrity that comes from a Christian worldview. All cyber programs are located in the School of Business. Students learn from dedicated faculty with decades of real-world experience and who are committed to student success.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

(434) 592-7321
schoolofbusiness@libertyedu

liberty.edu/business/cyber-excellence

Liberty Students in the Cybersecurity Program

LONG BEACH CITY COLLEGE

LBCC Campus

Long Beach City College (LBCC) consists of two campuses with an enrollment of more than 25,000 students each semester. LBCC is one of the largest and oldest California community colleges in the state. Founded in 1927, LBCC is committed to providing delivering high-quality educational programs and support services to our diverse communities.

LBCC serves the cities of Long Beach, Lakewood, Signal Hill, and Avalon and promotes equitable student learning and achievement, academic excellence, and workforce development by delivering high-quality educational programs and support services within four schools housing its instructional programs. Long Beach City College's primary purpose is to prepare students for transfer to baccalaureate-granting institutions, career

development, and to support the community through economic development programs. The College's reputation is further enhanced by innovative partnerships like the Long Beach College Promise 2.0.

The LBCC Computer Networking and Security program offers both an Associate of Science and Certificate of Achievement that are recognized as National Security Agency Center of Academic Excellence-2Y awards. The program began in 2013 and is one of the largest onsite cybersecurity programs in the state of California. It focuses on hands-on, up-to-date, practical skills in cybersecurity and information technology fundamentals. Prior graduates are working for the Department of Defense, Microsoft, Sony, East West Bank, and the Central Intelligence Agency.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Garrett Whelan
(562) 938-3244
gwhelan@lbcc.edu

lbcc.edu/cybercenter

LBCC Cybersecurity Student

LORD FAIRFAX COMMUNITY COLLEGE

LFCC Campus

Founded in 1970, **Lord Fairfax Community College (LFCC)** is a comprehensive, multi-campus public institution of higher education. Through its four locations - the Middletown and Fauquier campuses, Luray-Page County Center, and Vint Hill - the college serves eight localities in the Shenandoah Valley and Piedmont regions of Virginia.

Lord Fairfax Community College (LFCC) offers two pathways to develop the skills and knowledge needed to embark on a successful career within the field of cybersecurity: the Associate of Applied Science (AAS) in Cybersecurity and the Cybersecurity Career Studies Certificate (CSC). The AAS degree program can be completed in two years with potential transfers to four-year bachelor degree programs or by choosing employment in the cybersecurity field. The CSC can be completed in one year and can be transferred into the AAS degree program at a later time, if desired. It is for the associate degree that Lord Fairfax is designated as a National Center of Academic Excellence in Cyber Defense.

The cybersecurity faculty at Lord Fairfax Community College strive to incorporate into their classes the latest technologies and methods that a security defender must exercise to thwart attackers. Faculty incorporate a wealth of knowledge through education and internship experiences in several facets of cybersecurity including penetration testing, secured software development, security policies, risk management, firewalls, digital forensics and cyber-law. These experiences provide a diverse and solid foundation, allowing LFCC students to pursue numerous opportunities in the field of cybersecurity.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Dr. Henry Coffman
(540) 868-7117
hcoffman@lfcc.edu

lfcc.edu/cybersecurity

LFCC Cybersecurity Class

Louisiana Tech's College of Business

LOUISIANA TECH UNIVERSITY

Louisiana Tech University's Center for Information Assurance, housed in the College of Business, serves as a focal point for cybersecurity research and education in the northern Louisiana region. The mission of the Center is to foster, support, and conduct innovative education, training, and research in information assurance and cybersecurity across all types of industries throughout Louisiana and the Southeastern United States. The Center supports educational programs at the undergraduate, masters, and doctoral levels in order to assure a supply of well-trained and capable information assurance and cybersecurity educators and experts. The Center offers an interdisciplinary, collaborative research environment that is led by faculty of the College of Business' Department of Computer Information Systems.

Programs supported by the Center include undergraduate and graduate certificates in information assurance, and a research-focused doctoral program. The Center also houses the Digital Forensics Lab, which faculty and graduate students use to conduct behavioral security research.

Graduates from Center-promoted programs are employed by organizations across the country and in a variety of industries, including government and government contracting, telecommunications, cybersecurity and defense, financial services, and healthcare.

Faculty affiliated with the Center hold editorships of major journals, and leadership positions in international conferences, including the IFIP-affiliated Dewald Roode Workshop on Information Systems Security Research, the ACM SIGMIS Computers and People Conference, and the Americas Conference on Information Systems. Faculty have published security-related research in numerous prestigious journals, including *Decision Support Systems, Information Systems Frontiers, and Communications of the ACM.*

DESIGNATIONS

• CAE - Cyber Defense Education
• CAE - Cyber Defense Research

CONTACT INFORMATION

Louisiana Tech University
(318) 257-2026
ellis@latech.edu
business.latech.edu/center-for-information-assurance/

Cyber Students Collaborating

Marquette University's campus is located in Milwaukee, WI

Located near the heart of downtown Milwaukee, Wisconsin, **Marquette University** is a Catholic and Jesuit university that offers a comprehensive range of majors in 11 nationally and internationally recognized colleges and schools. Through both our academic and co-curricular programs, Marquette strives to develop men and women who will dedicate their lives to the service of others, actively entering into the struggle for a more just society. We expect all members of the Marquette community, whatever their faith traditions, to give concrete expression to their beliefs by giving of themselves in service to those in need.

The mission of the Center for Cyber Security Awareness and Cyber Defense at Marquette University is to provide excellence in education about cybersecurity, service through partnerships with the university and community, and research opportunities in cybersecurity technology, cybersecurity preparedness, and cybersecurity education.

Marquette University's master of science in computing with a specialization in information assurance and cyber defense is designed to establish the knowledge about security planning and management, and cyber issues and defenses for networks, databases, and computing infrastructure. This specialization is the academic focus for the designation of Marquette University as a National Center of Academic Excellence in Cyber Defense Education.

The courses for this specialization reflect a broad technical perspective. While studying theory and performing classroom exercises serve to provide foundational knowledge, practical experience reinforces understanding. Our program requires students to demonstrate their understanding through a practical, professional experience. In addition, Marquette University has been recognized by U.S. News & World Report, ranking 11th nationally in Best Online Graduate Computer Information Technology Programs.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Thomas Kaczmarek
(414) 288-6734
thomas.kaczmarek@marquette.edu

marquette.edu/cyber-security

Cybersecurity Student

Marymount University Campus

MARYMOUNT UNIVERSITY

Marymount University is an independent Catholic university in Arlington, VA, close to many federal government agencies including the Department of Homeland Security, the Central Intelligence Agency, and the Pentagon. The school offers progressive cybersecurity programs at the undergraduate, masters, and doctoral levels. within the context of a liberal arts education. There are currently over 400 students in the various cybersecurity programs.

The BS in Information Technology is the third largest program at the university. After receiving a core knowledge across the computer science curriculum, students select one or more specialties including networking and cybersecurity, applied cybersecurity, cloud computing, computer science, forensic computing, and data science. The BS in Cybersecurity is an accelerated second-degree program for career changers who have completed a 4-year degree at an accredited institution in another subject area and looking to join the cybersecurity workforce.

At the master's level, Marymount offers an MS in Information Technology, with a specialization in Cybersecurity, designed primary for career changes with management in mind. The MS in Cybersecurity is offered for students who are IT professionals and includes specialties in digital health and data science. A variety of dual degrees are also available, combining IT or Cybersecurity with an MBA or MS in Health Care Management, or combining the IT and Cybersecurity degrees. At the doctoral level, a D.Sc. in Cybersecurity is designed specifically for working cybersecurity professionals. The emphasis is on applied research across a wide variety of cybersecurity areas including cyber threat intelligence, human factors, machine learning applications, and more.

DESIGNATIONS

• CAE–Cyber Defense Education

CONTACT INFORMATION

Dr. Diane Murphy
(703) 284-5958
dmurphy@marymount.edu
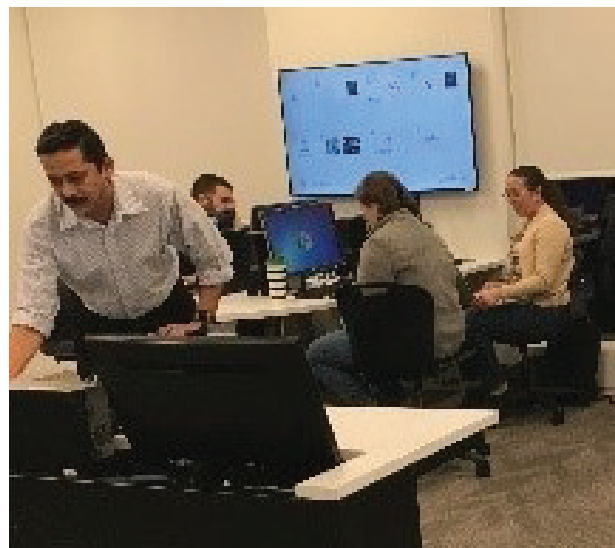
Mercy College, Dobbs Ferry Campus

MERCY COLLEGE

Founded by the Sisters of Mercy in 1950, **Mercy College** became a four-year college offering baccalaureate degrees in 1961. Mercy is a New York metropolitan area college of more than 9,000 students studying at four campuses and online. The main campus is in Dobbs Ferry with branch campuses in the Bronx, Manhattan, and Yorktown. The college expanded its offerings to include online programs in the 1990s, and soon was able to offer entire degree programs online.

Mercy College is committed to providing motivated students the opportunity to transform their lives through higher education by offering liberal arts and professional programs in personalized and high quality learning environments, thus preparing students to embark on rewarding careers, to continue learning throughout their lives and to act ethically and responsibly in a changing world.

The Mercy College Cybersecurity Program offers classes at the Dobbs Ferry campus, the Bronx Campus, and the Manhattan campus. The Mercy Cybersecurity Education Center (MCEC) was founded in January 2008 with a mission to develop high quality cybersecurity professionals by providing:

- Undergraduate and graduate cybersecurity education with experience in a variety of technology-driven solutions
- Research and development for skills to identify security issues and defend cyber threats across private, public, and corporate infrastructure
- Services to social and academic communities for cutting-edge cybersecurity technology advancement

Mercy College was designated as a CAE in Cyber Defense education in 2011.

DESIGNATIONS

- **CAE – Cyber Defense Education**

CONTACT INFORMATION

John Yoon
(914) 674-7461
jyoon@mercy.edy

cysecure.org • mercy.edu/ias

Mercy Cybersecurity Education Center

METROPOLITAN COMMUNITY COLLEGE - KANSAS CITY

MCC Penn Valley Campus

Metropolitan Community College (MCC) is the oldest and largest public institution of higher learning in Kansas City, Missouri, founded in 1915 as the Kansas City Polytechnic Institute. The Junior College of Kansas City, as it was known starting in 1919, was one of the first schools in the country to award an associate's degree. Today, MCC offers 125 associate degrees and certificate programs.

Metropolitan Community College comprises five campuses serving more than 30,000 students annually on the Missouri side of the Greater Kansas City area. MCC is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools. MCC offers a program path for students starting careers in cybersecurity. The A.A.S. Secure Systems Administration and Engineering program allows students to earn stackable certificates, mapped to industry credentials, while working to complete an A.A.S. degree.

The Secure Systems Administration and Engineering program has experienced significant growth in recent years, and has produced well over 100 program completers during that time. In 2018, MCC achieved the designation as a Center of Academic Excellence in Cyber Defense at 2-year institutions (CAE-2Y).

MCC was an original member of the Cybersecurity Education Consortium (CSEC) and is a current member of the National CyberWatch Center. MCC remains active in the CAE community and the Cybersecurity Program Coordinator, Brian Hurley, serves as a mentor for other schools seeking CAE designation.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Brian Hurley
(816) 604-6659
brian.hurley@mcckc.edu

mcckc.edu/cyber

MCC System Administration

![Metropolitan Community College logo] METROPOLITAN Community College

Fort Omaha Building 8

Metropolitan State University in Saint Paul, Minnesota is an accredited, comprehensive urban university that provides accessible and affordable educational programs to the citizens and communities of the twin-cities metropolitan area, with continued emphasis on underserved groups including adults and communities of color.

Faculty, staff, and students at Metropolitan State University reflect the area's rich diversity that builds a culturally competent learning community and demonstrates an unwavering commitment to civic engagement. As a Yellow Ribbon company, Metropolitan State University provides veterans and active military personnel with community support, training, access to services, and the resources to further their personal and professional goals.

The university proudly houses MN Cyber, a statewide education, research, and training institute for cybersecurity, forensics, and IoT, with the main goal to position Minnesota as a national leader in cybersecurity and its related workforce through education, legislative and community engagement, and innovative public-private partnerships. The institute also helps foster the statewide cybersecurity ecosystem by providing necessary infrastructure, research, education, and training capabilities to all stakeholders including K-12 schools, institutions of higher learning, private businesses, state government, staffing and recruiting agencies, the Minnesota National Guard, and other local organizations. Through MN Cyber Range, the university provides advanced cybersecurity training.

The institute receives its guidance through the advisory board comprised of CISOs from major organizations such as United Health Group, 3M, US Bank, and Best Buy, and state legislators. The university's current cyber offerings include a BS in Cybersecurity, BAS in Forensics, BAS in Information Assurance, and MS in Cyber Operations.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Gary Sparks
(531) 622-3854
gsparks@mcc.edu

neb.edu

Mercy Cybersecurity Education Center

METROPOLITAN STATE UNIVERSITY

Metropolitan State University, St. Paul Campus

Metropolitan State University, a member of the Minnesota State higher education system, is an accredited, comprehensive, urban university that provides accessible, affordable, high-quality student-centric educational programs to the citizens and communities of the twin-cities metropolitan area, with continued emphasis on underserved groups, including adults and communities of color. The university's faculty, staff, and students reflect the area's rich diversity, build a culturally competent and anti-racist learning community and demonstrate an unwavering commitment to civic engagement. The university is a "Yellow Ribbon" company and provides veterans and active military personnel with community support, training, access to services, and the resources to further their personal and professional goals. The University proudly houses MN Cyber; a statewide education, research, and training institute for cybersecurity, forensics, and IoT, with the main goal to position Minnesota as a national leader in cybersecurity and its related workforce through education, legislative and community engagement, and innovative public-private partnerships. The Institute helps foster the statewide cybersecurity ecosystem by providing necessary infrastructure, research, education, and training capabilities to all the stakeholders including K-12 schools, institutions of higher learning, private businesses, state government, staffing and recruiting agencies, the Minnesota National Guard, and other local professional organizations. The Institute also provides advanced cybersecurity training through MN Cyber Range. The Institute receives its guidance through the advisory board that comprises of CISOs from major organizations (United Health Group, 3M, US Bank, Best Buy etc.) as well as state legislators.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Faisal Kaleem
(651) 793-1238
faisal.kaleem@metrostate.edu

mncyber.org

Professor Kaleem with a diverse group of students

Middle Georgia State University's 8,000+ students attend classes on campuses in Macon (pictured), Cochran, Dublin, Eastman and Warner Robins and online. In fact, the bachelor's and master's degrees in Information Technology both are fully online.

MIDDLE GEORGIA STATE UNIVERSITY

Middle Georgia State University (MGA) is a regionally focused university serving 8,000 traditional and adult students with campuses in Macon, Cochran, Dublin, Eastman, and Warner Robins. The University is one of the state's best values in public higher education; a student can earn a bachelor's degree for about $20,000, which is about $2,500 in tuition and fees per semester.

Our Department of Information Technology has programs that prepare students to solve problems and apply new technologies within an increasingly interconnected and changing global environment. They emphasize career success through lifelong learning and professional development at all levels of the curriculum.

The School of Computing at MGA offers a Bachelor of Science in Information Technology (BSIT)

program, which is accredited by the ABET, Inc. and includes a major concentration in Cybersecurity. MGA also offers a fully online Master of Science in Information Technology with a concentration in Cybersecurity and Forensics.

With an enrollment of nearly 950 students, the School of Computing is fully equipped to produce the next generation of technology and cybersecurity experts. Students have one-on-one interaction with highly qualified faculty members who are also actively engaged in research publications and scholarly activities.

Students utilize state-of-the-art digital forensics and security labs. Outside the classroom, students participate in cyber defense competitions. Each year, the School's Center for Cybersecurity Education and Applied Research (CCEAR) hosts an Academic Cybersecurity Seminar to offer students and the community the opportunity to network with experts in the cybersecurity field.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Kevin Floyd
(478) 471-2801
kevin.floyd@mga.edu

mga.edu/ccear

Middle Georgia State cybersecurity students visit the Pentagon as part of the School of Computing's Cyber Security Academic Seminar, a course for cyber security students to participate in an academic "domestic study abroad" seminar in Washington, DC

MISSISSIPPI STATE UNIVERSITY

The High Performance Computing Collaboratory hosts the 4th most powerful academic supercomputer.

Mississippi State University (MSU) has been a part of the NSA Center of Academic Excellence Program since 2001. Currently, MSU holds all three CAE designations for which Carnegie classified Doctoral Universities: Very High Research Activity may qualify. The MSU CAE effort is led by MSU's **Center for Cyber Innovation (CCI)**. CCI is part of the High Performance Computing Collaboratory at Mississippi State University. CCI develops cutting-edge solutions for Defense, Homeland Security, and the Intelligence Community. The primary focus of CCI is to research, prototype, and deliver cyber solutions that support global national security, homeland security, and peacekeeping operations.

CCI has been a pioneer in cyber defense research. Security architecture provides the blueprint for in-depth defense strategies. You cannot avoid cyber threats if you do not know how systems connect and what software those systems are running. Scalable, security architecture is a critical enabling technology required to model, defend, and wargame network-intensive cyber networks.

MSU supports one of the most robust cyber infrastructures of any university. CCI researchers have access to state-of-the-art high performance computing assets to include petabyte scale high-speed storage. CCI has the capability to scale up laboratory research into enterprise scale cyber demonstrations and to do so in NOFORN and other restricted environments.

Academically, MSU students pursuing the CAE-CO path complete our Master of Science in Cyber Security & Operations. There are multiple paths for students from Arts & Sciences, Business and Engineering to complete the Information Assurance Certificate that completes the CAE-CDE path.

DESIGNATIONS

• CAE - Cyber Defense Education
• CAE - Cyber Defense Research
• CAE - Cyber Operations

CONTACT INFORMATION

Dr. Drew Hamilton
(662) 325-2294
hamilton@cci.msstate.edu

cci.msstate.edu

MSU cybersecurity students pictured with the NSA-sponsored Shadow supercomputer at HPC2.

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Missouri S&T Campus

With more than a decade as a CAE-R designated university and eight cybersecurity experts with active federal and industry research in the field, **Missouri S&T** is one of the nation's leaders in addressing cybersecurity threats. Missouri S&T's cybersecurity research program emphasizes cyber-physical security for critical infrastructures – from power plants to autonomous vehicles. The S&T computer science and computer engineering programs partner with 16 engineering and science disciplines across campus to create secure smart grid systems, manufacturing systems, sensor clouds, water treatment facilities, aerospace systems, and smart living environments.

S&T's cybersecurity experts are also highly regarded teachers. They actively mentor student researchers at the undergraduate, master's, and doctoral levels to prepare them for cybersecurity careers in government, industry, and education. Students have access to cybersecurity courses that meet the NICE criteria at the advanced undergraduate and graduate levels.

Missouri S&T is a STEM-focused institution of 9000 students. It was founded in 1870 as one of the first technological institutions west of the Mississippi. The pursuit of innovative, collaborative applications with faculty and researchers at Missouri S&T has helped the university define its research and teaching strengths. The following four signature research areas connect to long-term critical national issues, research and entrepreneurship potential, and align with Missouri S&T's strategic plan. These areas are Advanced Manufacturing, Advanced Materials for Sustainable Infrastructure, Enabling Materials for Extreme Environments, and Smart Living.

DESIGNATIONS

• CAE – Cyber Defense Research

CONTACT INFORMATION

Bruce McMillin
(573) 341-4491
ff@mst.edu

cae.mst.edu

S&T students participate in a cybersecurity hackathon.

MVCC Utica Campus

MOHAWK VALLEY COMMUNITY COLLEGE

Mohawk Valley Community College (MVCC) provides accessible, high-quality educational opportunities to meet the diverse needs of our students. We are the community's college, committed to student success through partnerships, transfer and career pathways, and personal enrichment.

In 2018, MVCC was designated as a National Center of Academic Excellence in Cyber Defense for its Associate of Science in Computer Science. This program combines the study of criminal justice and computer-technology to address current needs in the cybersecurity field. It prepares students to identify vulnerabilities and threats that affect corporate and government computer networks, to protect critical information in cyberspace, and to effectively design, implement, and support security policies for a large scale enterprise network. Students examine a wide variety of security analysis and defensive tools and concepts and then attempt to circumvent them. This program prepares students to transfer to upper division cybersecurity programs or assume entry-level positions in the cybersecurity industry.

When the CAE Program Management Office created CAE Regional Resource Centers (CRRC) in 2016, MVCC was appointed as the Northeast CRRC. During their tenure in this position, MVCC performed outreach and built relationships with educational institutions in the region, as well as guide candidate colleges in the area on the path to designation. Notably, MVCC collaborated with faculty from other CAE institutions to create a professional development course for Career and Technical Education (CTE) instructors transitioning to cybersecurity and a cybersecurity CTE curriculum that aligns with the CAE Knowledge Units.

DESIGNATIONS

- **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Jake Mihevc
(315) 792-5653
jmihevc@mvcc.edu

mvcc.edu/cyberlab

MVCC Cybersecurity Class

Montreat College Campus

MONTREAT COLLEGE

In 2017, **Montreat College** was designated a National Center of Academic Excellence in Cyber Defense Education by NSA and DHS for its Bachelor of Science in Cybersecurity degree. This degree equips students with the knowledge and skills necessary to serve in today's competitive business and government environment. Operating under the college's Center for Cybersecurity Education and Leadership, Montreat's program emphasizes character and ethics as essential components of cybersecurity education.

Montreat College's program provides training and preparation in information technology, cybersecurity, business administration, and quantitative analysis, preparing students for a variety of professional positions in the changing world of cybersecurity. Montreat's approach combines the theoretical with the practical, as faculty bring extensive real-world technology and security experience to the classroom. Small classes provide personal attention and one-on-one interaction with professors. Classroom instruction is often augmented with outside technology speakers and information technology facility tours. In many courses, student projects involve problem solving and providing solutions to real-world problems and working with real organizations. Additionally, all students complete cybersecurity internships prior to graduation. These internships can lead to permanent employment opportunities. Montreat College hosts the RETR3AT Cybersecurity Conference each fall and requires all cybersecurity students to attend, allowing additional interaction with professionals working in the field.

Since receiving the CAE-CDE designation, Montreat College has added cybersecurity certificate programs, a cybersecurity associate degree program, and a Master's of Business Administration with a concentration in cybersecurity management. In addition, Montreat College has continued to reach out by providing cybersecurity basics and advanced camps for rising 9th – 12 grade students.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Kelli Burgin
kelli.burgin@montreat.edu

montreat.edu/academics/undergraduate/cybersecurity

Montreat Cybersecurity Course

MORAINE VALLEY COMMUNITY COLLEGE

MVCC Campus

Moraine Valley Community College (MVCC) was the first community college in the country to offer an Associates of Applied Science (AAS) degree in cybersecurity. MVCC was a member of the 2010 inaugural class for two-year institutions earning CAE designation. As an early member of the academic cybersecurity community, the faculty and staff at MVCC addressed some of the challenges in offering a practical and relevant cybersecurity program. One of the first innovations addressed was teaching cybersecurity concepts and technologies in a safe environment in which students could learn and explore. The MVCC team created a virtual teaching and learning center and has developed a lab library of over 400 exercises. This environment and lab library have been adopted by over 250 institutions nationwide. As a Regional Resource Center, MVCC offers a full faculty development program each

summer that has served over 5000 teachers.

The MVCC team is also very active in the NSA mentoring program. Over the years, MVCC has mentored over 30 institutions. The MVCC program services over 300 students each semester and has placed graduates in every major industry and in multiple government agencies. MVCC also partners with several industry certification organizations and business partners in offering sponsored certification courses within our curriculum. These would include CompTIA, EC-Council, Palo Alto Networks, Cisco, LPI, Dell VMware, ISC2 , and ISACA. The MVCC program is distinguished in the fact that we offer several leading-edge specializations including IoT, Mobile and Cloud Computing, and Industrial Controls Security.

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

John Sands
(708) 974-5426
Sands@MoraineValley.edu

www.CSSIA.org

Students learning about PLCs

Morgan State University's Network Information and Embedded Systems Security Center of Academic Excellence (NIESS-CAE) is designed to provide a portal through which our students and faculty can learn about reducing vulnerabilities in our national information infrastructure. Morgan has a commitment to the development of academic programs in support of a Cyber Security Center of Excellence. Certificate options are being developed for the Electrical Engineering, Computer Science and Information Science and Systems Departments. Within the Electrical Engineering program, there are currently four options, based on academic level, that a student can take as a pathway to cybersecurity learning.

We have established a process that provides programs in the field of cyber defense education at the graduate and undergraduate levels; continuously improves the quality of our cyber defense program, curriculum, faculty and students; and provides the nation with a pipeline of qualified students eager to become cyber defense professionals.

With this process in place, we expect to produce a growing number of professionals with expertise in various cyber defense disciplines. Morgan has one of the highest graduation rates of African-American electrical engineers and we hope to open the cybersecurity market to this community.

DESIGNATIONS

• CAE-Cyber Defense Education

CONTACT INFORMATION

Dr. Kevin Kornegay
(443) 885-4869
kevin.kornegay@morgan.edu

morgan.edu/soe/niess-cae

MT. HOOD COMMUNITY COLLEGE
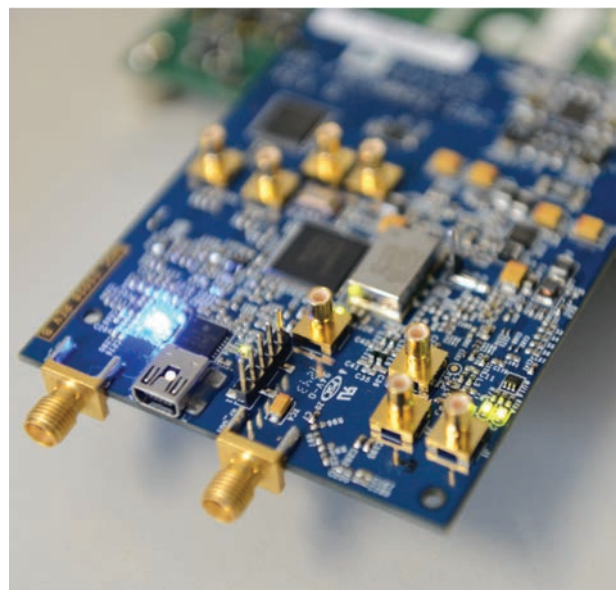
Mt. Hood Campus

The CyberSecurity and Networking Degree program at **Mt. Hood Community College (MHCC)** was initiated in 2011 and was the first AAS degree in cybersecurity in Oregon. Using support for curriculum, training, and travel generously provided by CyberWatch and CyberWatch West, MHCC faculty created the Oregon Center for Cyber Security (OCC-SEC) and became a CAE-2Y college in 2014. Although founded on existing IT and Cisco Networking training, MHCC faculty chose to focus on training directed towards specific industry recognized certifications such as the A+, Linux+, Security+, CCNA and CCNA Security, Oracle certifications and more.

In 2018-2019, MHCC had the opportunity to dramatically enhance the entire cyber program with the addition of trainings specific for Cisco Cyber Operations, Certified Ethical Hacker, Red Hat CSA, and Palo Alto Network firewall implementation. Adding a new degree pathway into Penetration Testing, as well as several certifications allows existing professionals in industry to hone their skills in a focused training path.

Using funding from an NSF grant, the CyberSecurity program created a collaborative effort with our Small Business Development Center (SBDC) and designed a small business advisory team using cyber student interns to deliver focused cybersecurity training, evaluation, and mentoring to local small and medium sized businesses. Between 2018 and 2019, over a dozen cyber students fulfilled their internship requirements by working directly to support members of the regional small business community.

Graduates from this program have gone on to excellent careers in local businesses, consulting firms, regional critical infrastructure, and military, and at least one-third of the graduates continue their education at some of the local four-year institutions.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Dr. Wayne Machuca
(503) 491-7631
wayne.machuca@mhcc.edu

mhcc.edu/cybersecurity

Mt Hood Cybersecurity Students

MURRAY STATE UNIVERSITY

MSU Campus

Murray State University is a public university that is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC), and designated as a CAE-CDE for the Bachelor of Science in Telecommunication Systems Management (TSM). Murray State received funding in 1998 for a Program of Distinction in TSM, using resources made available through the Regional University Excellence Trust fund, including a research center to address regional and national public and private sector needs. MSU has expanded its focus to support all aspects of the current digital technology transformation to stay abreast of new trends in the world of industry.

With this goal, Murray State students are prepared with skills needed to design, build, secure, and manage technology networks. Cybersecurity and cyber threat education are at the top of our telecommunication and computer curriculums, infusing cybersecurity across Murray State's education portfolio. As a CAE-CDE institution, both BS and MS cybersecurity programs at Murray State have been developed to promote cyber awareness and to prepare students for a broad spectrum information security career.

Since our designation as a CAE-CDE for our BS degree, we have expanded our cybersecurity educational labs by establishing joint scholarly activities with other CAE institutions and also cybersecurity companies to share the latest trends toward a common goal in this area. Murray State is very active in bringing high school students from our region for hands-on cyber activities and learning experiences paving the road for them for possible career opportunities in this field.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Dr. Abdul Yarali
(270)809-6915
ayarali@murraystate.edu

murraystate.edu

MSU Cybersecurity Class

NATIONAL UNIVERSITY

National University campus, San Diego, CA

Founded in 1971, **National University (NU)** is among the largest, private, nonprofit universities in California. Dedicated to making quality education accessible and affordable to adult learners who represent nearly 40 percent of the postsecondary population, NU offers programs at locations nationwide and online.

NU was among the first schools in San Diego to offer a master's degree in cybersecurity in 2011 and, through its Department of Engineering and Computing, launched a bachelor's program in April 2017, making it the only school in San Diego to offer both degree programs. NU is one of just seven designated centers in California and the first in San Diego to be named a CAE-CDE.

Cybersecurity programs are tailored to meet workforce demands conveyed directly to faculty by the University's Cybersecurity Advisory Board – consisting of industry representatives from public, private, and government organizations.

NU established over 50 academic partnerships with private and public organizations to prepare students to meet industry standards and has articulation agreements with more than 100 community colleges.

To inspire future cybersecurity professionals, NU supports community partners with the SoCal Cyber Cup Challenge for middle and high school students in San Diego and neighboring counties. As a Hispanic Serving Institution, NU was selected by HACU to host the STEM Youth Leadership Development Forum in 2017, an interactive day of exploring STEM fields, including cybersecurity, for over 500 middle and high school students.

A veteran-founded nonprofit, NU was named a military-friendly college, and one in four NU students are active-duty servicemembers or veterans.

DESIGNATIONS

- **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Chris Simpson
(858) 309-3418
csimpson@nu.edu

nucsia.nu.edu
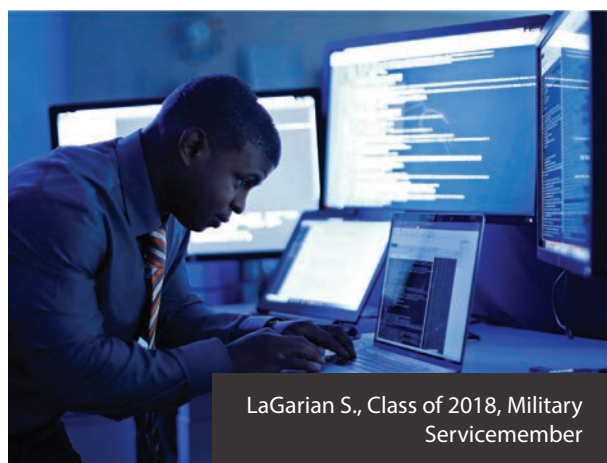
LaGarian S., Class of 2018, Military Servicemember

NAVAL POSTGRADUATE SCHOOL
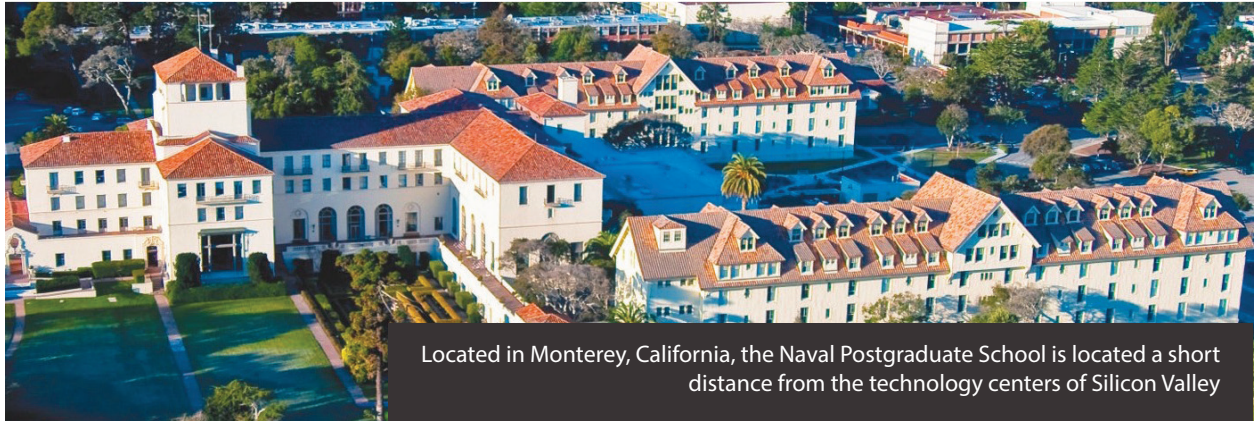
Located in Monterey, California, the Naval Postgraduate School is located a short distance from the technology centers of Silicon Valley

The **Naval Postgraduate School** provides relevant and unique advanced education and research programs to increase the combat effectiveness of commissioned officers of the naval service to enhance the security of the United States. Established in 1909, NPS moved west to Monterey, California in 1951. Today, NPS serves naval, defense and national security related interests by enhancing current and future readiness, fostering advances in technology, and providing educational and operational programs that directly support all facets of national defense and homeland security.

At NPS, four world-class schools oversee 14 academic departments that offer 77 Master's degrees, 16 doctoral degrees and 60 certificate programs to the U.S. Armed Forces, DoD civilians and international partners.

Secure research facilities, interdisciplinary academic groups, 34 research centers, and specialized laboratories add to the wealth of resources. NPS offers both resident and distributed-learning programs. Continuous learning, refresher and transitional educational opportunities abound. In addition, executive education courses and a variety of short courses are also offered by NPS, both in Monterey and abroad.

Over 615 scholars and professionals comprise the NPS faculty. Students and faculty are deeply involved in the development, advancement and utilization of emerging technologies. Its proximity to Silicon Valley and other technology centers, offers members of the NPS community opportunities for collaboration with industry and academe. For over 25 years, by combining classroom instruction with hands-on experimentation, NPS has played a leadership role in cyber defense and cyber operations.

DESIGNATIONS

• CAE - Cyber Defense Education
• CAE - Cyber Defense Research
• CAE - Cyber Operations

CONTACT INFORMATION

Cynthia E. Irvine
(831) 656-2461
irvine@nps.edu

my.nps.edu/web/c3o

NPS provides graduate education to U.S. Armed Forces, DOD and selected civilians, and international partners

NEW JERSEY CITY UNIVERSITY

NJCU Campus

The **New Jersey City University (NJCU)** Cybersecurity program is an interdisciplinary center for cybersecurity education, training, and research. The center aims to provide current and future professionals with the knowledge and skills necessary to strive and compete within the cybersecurity community. Our student's foundation is built through their degree program, certificates,f and research opportunities.

NJCU students have realized significant career success as a result of our Information Assurance/Cyber Security offerings. Students are working in agencies such as the New Jersey Office of Homeland Security and Preparedness, United States Department of Homeland Security, The Regional Operational Intelligence Center of the New Jersey State Police (Fusion Center), Coast Guard Intelligence, Naval Intelligence, National Security Agency (directly and with contractors), and others. Additionally, we have graduates that have enhanced their careers even on the municipal policing level, working to develop their agency's information assurance programs. We also have those working in the private corporate sector.

The Cybersecurity Club at NJCU is a student-run organization focused on Cyber and Information Security topics. We provide free training using advanced technologies in digital forensics, log analysis, server configuration and hardening, virtualization, and industry leading certificates training. We utilize state-of-the-art Cyber Lab also known as Simulated Command Center with Cyber Lab located in the Professional Studies building.

President Sue Henderson Ph.D. is immensely supporting the advancement of our cybersecurity program, training, and research.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Kutub Thakur
(201) 200-2230
kthakur@njcu.edu
njcu.edu/professional-security-studies/
cyber-security

President Dr. Sue Henderson (Middle), Dean Dr. Deborah Woo (Left) Dr. Kutub Thakur(Right) Assistant professor and director of cybersecurity program

New Mexico Tech Entrance

New Mexico Tech is a public education and research university focused in science, technology, engineering, and mathematics, and is classified by the Carnegie Classification as a Research Doctoral: STEM-Dominant Institution.

With a long history of national defense related research, the Computer Science and Engineering (CSE) department at New Mexico Tech started to offer cybersecurity focused educational programs in 2001. The Information Technology (BS in IT) program, with the special emphasis on cybersecurity, was developed to serve as a national powerhouse for better training cybersecurity workforce with integrated research, training, and educational efforts. The CSE department offers BS in Computer Science, MS in Computer Science, and PhD in Computer Science degree programs. In addition, the department recently developed and offered a graduate certificate program in cybersecurity for graduate students and post-baccalaureate professionals who want to build and strengthen their capabilities in cybersecurity for their academic and professional work. The cybersecurity program at the department includes foundational course offering such as Cryptography and Applications, Foundations of Information Security, Information Protection and Security, and Network Security, as well as many special topic and advanced courses on cybersecurity such as Access Control & System Security, Secure System Administrations, and Hardware-based Network Security.

New Mexico Tech is also the home of the Institute for Complex Additive Systems Analysis (ICASA), established by the New Mexico Legislature as a computer security and forensics division focused on cyberterrorism and cybercrime.

DESIGNATIONS

• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Dr. Dongwan Shin
(575) 835-6459,
dongwan.shin@nmt.edu

cs.nmt.edu/~IA

NMT Cybersecurity Center

NEW YORK UNIVERSITY

New York University (NYU) is a private doctoral research university which is accredited by the Middle States Commission on Higher Education and New York State to award bachelor, masters, and advanced certificate degrees. The CAE-CO designation is for our Master of Science in Cybersecurity program. The CAE-R designation is for our Doctor of Philosophy in Computer Science program. The face-to-face program has been in existence at NYU for many years. This year, we extended the program to allow working adults from all over the country to remotely participate part-time in the program and attracted over a hundred students in our first cohort.

Due to the dedicated and successful work of promoting excellence in its cybersecurity programs, NYU has taken significant steps to institutionalize and sustain efforts through multiple educational and research initiatives. Recent initiatives include the

establishment of The NYU Center for Cybersecurity (CCS). NYU CCS is an interdisciplinary research institute dedicated to training the current and future generations of cybersecurity professionals and to shaping the public discourse and policy, legal, and technological landscape on issues of cybersecurity. NYU CCS is a collaboration between the NYU School of Law, NYU Tandon School of Engineering, and other NYU schools and departments. NYU CCS has institutional support as it helps NYU to deliver interdisciplinary cybersecurity education.

NYU offers students many diverse career and academic paths through four different graduate programs in cybersecurity. These include full and part-time online applied Master of Science degree in Cybersecurity, an interdisciplinary program in cybersecurity risk and strategy and a traditional academic Ph. D. in computer science with a focus in cybersecurity. The MS in Cybersecurity has the option to take courses both on-campus and online. A part-time lock-step curriculum for US citizens who want to pursue the MS in Cybersecurity online is available through the NY Cyber Fellowship program. The NY Cyber Fellowship provides a 75% scholarship towards tuition for the elite online Cybersecurity Master's Degree.

In the MS in Cybersecurity Risk and Strategy (CRS), courses are taught from a comprehensive perspective that combines the benefits of top-tier schools and leading faculty from computer science, law, policy, and business. CRS is a one-year program intended for experienced professionals from a range of backgrounds who seek to deepen their understanding of cybersecurity risk and strategy.

DESIGNATIONS

• **CAE - Cyber Operations**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Nasir Memon
(646) 997.3970
memon@nyu.edu

cyber.nyu.edu

North Carolina A&T Campus

The Center for Cyber Defense at North Carolina Agricultural and Technical State University (NC A&T) was designated as a National Center of Academic Excellence in Information Assurance Education for the Academic Years 2010-2015 and was redesignated as National Center of Academic Excellence in Cyber Defense Education (CAE- CDE) for the Academic Years 2014-2021.

The Center for Cyber Defense at NC A&T was designed to educate and prepare students to serve the United States as professionals in the field of cybersecurity. The primary goal towards meeting this objective is to develop its integrated education and interdisciplinary research program in cybersecurity.

The Department of Computer Science (CS) offers the following programs: B.S. Certificate in Cybersecurity; B.S. in CS with a Cybersecurity track; M.S. in CS with a Cybersecurity track.

Faculty in the Center for Cyber Defense at NC A&T conduct research in various areas of cybersecurity, including cyber identity, big data and data analytics for cybersecurity, cloud security, biometric-based authentication, software security, usable security, human factors in security, mobile security, and assured social computing.

The research and education activities in the Center for Cyber Defense are funded by the Department of Defense, National Science Foundation, National Security Agency, and National Nuclear Security Administration.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Xiaohong Yuan
(336) 285-3693
xhyuan@ncat.edu

ccd.ncat.edu

Students Working in the Cyber Defenders Lab

NORTH CAROLINA STATE UNIVERSITY

Hunt Library on NC State's award-winning Centennial Campus is consistently ranked among the world's top libraries, providing computer science students and faculty with unparalleled resources

North Carolina State University was one of the first National Centers of Academic Excellence in Cybersecurity Research (CAE-R), holding its designation since 2008. The university is located in Raleigh, NC and is part of the Research Triangle, which is home to three large research universities and many technology companies, including IBM, Cisco, NetApp, and RedHat. NC State's cybersecurity research expertise is based in the Secure Computing Institute (SCI), which is primarily associated with the Department of Computer Science, with ties to other departments, including Electrical and Computer Engineering, Psychology, and Business Management. SCI includes the Wolfpack Security and Privacy Research Laboratory and the NSA Science of Security Lablet at NC State. The university is also the home of the NSA Laboratory for Analytic Sciences..

Cybersecurity research at NC State spans many CAE focus areas, including principles, security mechanisms, architecture, assurance, and analysis. Research contributions range from theoretical to practical, from client-side to server-side, and the network in between. NC State has made strong contributions to the security and privacy of Android and iOS smartphones, building analysis tools to discover vulnerabilities and privacy flaws in both the platforms and their applications. Tackling hard problems in web browser security and developing novel analysis frameworks to help identify underlying principles that can lead to stronger protections for users, it has proposed novel security architectures for cloud platforms, providing security guarantees, and functionality via hypervisors. Software security research has identified new metrics for predicting security vulnerabilities. Its research in cryptography has shown how advanced cryptographic protocols can enhance privacy of blockchain-based systems, and explored new techniques to prove post-quantum security of existing cryptographic primitives.

DESIGNATIONS

• CAE – Cyber Defense Research

CONTACT INFORMATION

William Enck
(919) 513-7905
whenck@ncsu.edu

cae-r.ncsu.edu

WSPR Lab Faculty

NORTH IDAHO COLLEGE

NIC Campus

Founded in 1933**, North Idaho College (NIC)** is a comprehensive community college located on the stunning shores of Lake Coeur d'Alene. In 2017, NIC became the first community college in the state of Idaho to earn the Center of Academic Excellence in Cyber Defense in Two-Year education designation from the NSA and DHS.

NIC offers an Associate of Applied Science (AAS) degree and technical certificates in the Computer Information Technology (CITE) program. Faculty use lectures with a hands-on focus to provide a comprehensive education preparing students to be able to pass industry certifications and gain employment in the IT industry. Much of the latest hardware and software necessary to provide the quality training was purchased using a grant funded by the Department of Defense.

Our students are required to complete three credits of internship experience as part of the Advanced Technical Certificate and AAS degree. This experience enables individuals to further gain the required knowledge and skills to be successful in information technology and cybersecurity-related fields while undertaking real-life challenges across the information technology industry.

NIC has operated a Cisco Networking Academy for over 20 years, is a Microsoft IT Academy member institution, and maintains academic partnerships with industry leaders such as CompTIA and VMware. Since earning the CAE-2Y, NIC has also joined CyberWatch West and the National CyberWatch.

Faculty at North Idaho College have participated in the peer review process for candidates applying to NSA for the CAE-CDE designation and attended faculty professional development sessions by colleges and universities participating in the CAE-CDE program.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Kathleen Czurda-Page
(208) 769-5983
Kathleen.Czurda-Page@nic.edu

nic.edu

PC Architecture Course

NORTHEAST COMMUNITY COLLEGE

Northeast Community College Campus

Established by the State Legislature in 1973 as a comprehensive community college offering vocational/technical, liberal arts, college transfer, and continuing education, **Northeast Community College** is a two-year college serving residents of a 20-county area in the northeast edge of Norfolk, Nebraska. Northeast is the only community college in the state with one- and two-year vocational, liberal arts, and adult education programs all on one main campus.

Service Area

According to 2010 census figures, approximately 160,000 persons live in small towns, villages, and rural areas within the College's 20-county service area. Agriculture and agribusiness are the principal industries in the area. Northeast has three extended campuses and two regional offices to serve the needs of off-campus students in the 20-county service area.

Information Technology Degree Options

The information technology career field has many areas of specialization. To give students the ability to choose their areas of specialization, the information technology department has developed several AAS degree concentrations which focus on a wide variety of topics. Students choose from two of the following career concentrations: Cisco Networking Academy, Information Security, IBMi Application Development, Web and Visual Application Development, and Technical Services Support. Any student that chooses Information Security as one of their two concentration areas will complete the required Knowledge Units as identified for CAE-2Y designation.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Brad Vogt
(402) 844-7294
bradv@northeast.edu

cybercenter.northeast.edu

Brad Vogt, information technology instructor pictured with student

Northeastern University Campus

![Northeastern University Khoury College of Computer Sciences]

NORTHEASTERN UNIVERSITY

Cybersecurity has been a major focus of research and education at **Northeastern University** since the beginning of the 21st century. The University has been recognized as a CAE-CD since 2002, as a CAE-R since 2008, and as a CAE-CO since 2012.

Cybersecurity is treated as a cross-disciplinary field involving computer science, electrical engineering, political science, and law. Interdisciplinary teams of researchers work on security and privacy challenges in cryptography, cloud security, mobile and wireless, and malware analysis and detection. To integrate the cross disciplinary collaborations, the Cybersecurity and Privacy Institute was formed in 2016 with nearly 100 faculty and student researchers funded by government agencies such as NSF, DARPA, ONR, and IARPA as well as industrial supporters such as Google, Microsoft, and PriceWaterhouseCoopers.

Northeastern University is continuously expanding its cybersecurity education programs. Students are encouraged to participate in cybersecurity activities such as Capture the Flag, HackBeanpot, MITRE embedded CTF (winners in 2019), and DoE CyberForce (local winners in 2019). Since 2008, students participated in the National Collegiate Competition in Cyber Defense, winning the national championship in 2010. Strong student interest in the field prompted the creation of a BS degree in cybersecurity, introduced in 2017. The availability of NSF/SFS and DoD/CYSP scholarships has been a strong recruiting tool for the University.

Realizing that cybersecurity problems cannot be solved by technology alone, computer science faculty led the effort in designing interdisciplinary MS and PhD programs in cybersecurity to provide students a holistic view of cybersecurity, from both technical and socio-economic standpoints.

DESIGNATIONS

- **CAE - Cyber Defense Education**
- **CAE - Cyber Defense Research**
- **CAE - Cyber Operations**

CONTACT INFORMATION

Guevara Noubir
g.noubir@northeastern.edu

khoury.northeastern.edu
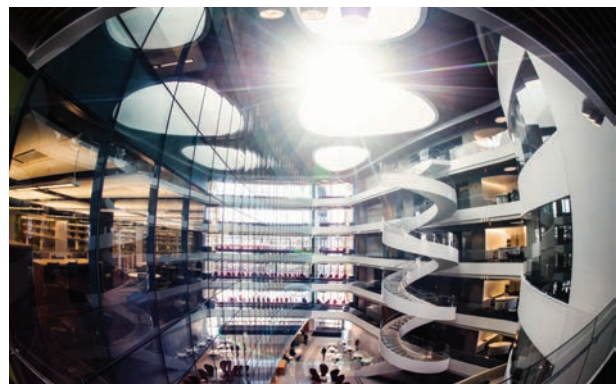
the Interdisciplinary Science and Engineering Complex (ISEC) at Northeastern University which houses the Cybersecurity graduate program and the Cybersecurity and Privacy Institute.

NORTHERN KENTUCKY UNIVERSITY

NKU Campus

Northern Kentucky University (NKU) is a growing metropolitan university of more than 14,000 students located in the southern suburbs of Cincinnati. NKU offered its first computer security course in 2000. The inception of the College of Informatics (CoI) in 2005 helped dissolve barriers between information disciplines, enabling faculty to rapidly create new cybersecurity programs.

Cybersecurity programs include minors in computer forensics and information security, certificates in corporate information security, cybersecurity, and secure software engineering, and security degree tracks in the information systems and information technology degree programs. CoI nearly doubled enrollment during its lifetime, while enrollment in the department of computer science has more than doubled its student population during the same period.

NKU was re-designated as an NSA CAE in Cyber Defense Education in 2019 for its program of Computer Information Technology – Cybersecurity Track. This track has higher security course requirements than the other three tracks of the program. NKU will begin offering a Bachelor of Science in cybersecurity in fall 2020.

NKU has held an annual cybersecurity symposium since 2007 with over 400 attendees. NKU has an active cyber defense team, which has competed in the National Collegiate Cyber Defense Competition (CCDC) since 2009. The team has placed first in the state regularly and competed in the national CCDC in 2014, placing sixth. NKU has also held a variety of cybersecurity outreach programs for K-12 students, including summer camps and workshops for Girl Scouts to obtain cybersecurity badges.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Yi Hu
(859) 572-7739
huy1@nku.edu

cis.nku.edu

NKU Cybersecurity Class

NORTHERN VIRGINA COMMUNITY COLLEGE

Students in NOVA's Cybersecurity program

Northern Virginia Community College (NOVA) is ranked as the 14th largest and 9th most diverse college or university in the country. With more IT associate degrees of any community college in the nation, it has been ranked the most digital community college in the United States. NOVA was also one of the first community colleges in the United States to have a Cybersecurity (originally named Network Security) program in place. In 2001, a Network Security Career Studies Certificate (CSC) was developed that later grew into an Associate of Science (AAS) in Cybersecurity. NOVA was a founding member of the National CyberWatch Center, and also serves as one of NSA's National Resource Centers, helping other colleges and universities nationwide become CAEs and CAE-2Ys.

NOVA's AAS Cybersecurity, with over 2,000 enrolled students, is very much an applied degree, designed to instill hard skills that the student can put into immediate practice in the workplace. The degree consists of 64 credits, of which 49 credits are hands-on IT/Cybersecurity courses, walking the student through an A+, Network+, Security+ curriculum, with more advanced security courses in the second year such as ethical hacking, and electives in Malware Reverse Engineering, Critical Infrastructure Security, and Cloud Computing. This focus on practical skills and topical security issues makes it an ideal degree for students who already have a degree in an unrelated discipline, such as history for example, and now wants to transition into a cyber career. For students just starting out, it transfers to seven different bachelor's degree programs (many of them CAEs) including George Mason University, Old Dominion University, George Washington University, Capitol Technology University, UMUC, ECPI, and Marymount University.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Dr. Margaret Leary
mleary@nvcc.edu

nvcc.edu/cybersecurity

NOVA at CyCon

Norwich cyber students

Norwich University offers three cybersecurity programs: Bachelor of Science in Computer Security and Information Assurance, Bachelor of Science in Cyber Security online degree completion program, and a Master of Science in Information Security and Assurance. The services of our graduates at all levels are in high demand by private industry, government, law enforcement, the military, health services, and academia. Whether they are focused on computer network security, malware, forensics, or cyber investigation, our students will be well prepared for the kind of job that never gets stale and protects our country and private interests. With a focus on both theory and hands-on experience, Norwich provides a truly unique program utilizing state-of-the-art forensic tools unheard of at other institutions of this size. Norwich faculty make sure students at all levels and programs have a command of the basics, and

then find opportunities for them both to work with companies on real cases.

Ranked #2 by the Ponemon Institute for Cybersecurity in the U.S., Norwich University programs are consistently ranked among the best in the nation for cybersecurity education. Norwich University is recognized as a National Center of Academic Excellence in Cyber Defense Education by the NSA and DHS and has received designation as a Center of Digital Forensics Academic Excellence by the Defense Cyber Crime Center. Beginning in 2002, Norwich University became a member of what is now called National Science Foundation's CyberCorps®: Scholarship for Service program. Norwich is partnered with the United States Army Reserve to develop cyber-education curricula that align with federal standards and cybersecurity needs. Most recently, Norwich's online graduate program was named one of the top 10 best cybersecurity graduate programs in the country by Universities.com.

Norwich is also home to GenCyber@NU, a National Security Agency and National Science Foundation-funded cybersecurity camp for high school students.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Huw O. L. Read
(802) 485-2007
hread@norwich.edu

norwich.edu/cyber

NOVA SOUTHEASTERN UNIVERSITY

NSU campus
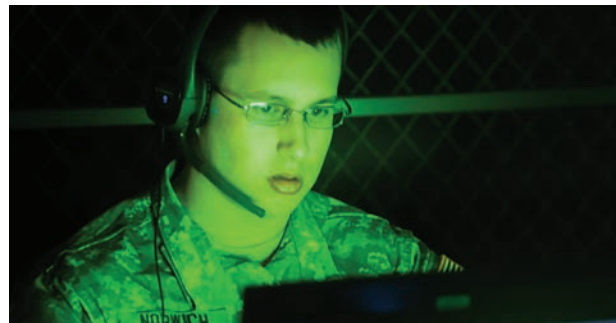
Nova Southeastern University (NSU)'s College of Engineering and Computing (CEC) is situated in a sprawling, 314-acre Fort Lauderdale-Davie campus. NSU, established in Fort Lauderdale, Florida in 1964 as a small college with some revolutionary ideas, currently has approximately 24,000 students and 172,000 alumni. NSU is classified as a research university with "high research activity" by the Carnegie Foundation for the Advancement of Teaching, and is one of only 50 universities nationwide to also be awarded Carnegie's Community Engagement Classification. It is the largest private, not-for-profit institution in the United States that meets the U.S. Department of Education's criteria as a Hispanic-Serving Institution.

Designated by NSA/DHS as a National Center of Academic Excellence in Cyber Defense Education

(CAE-CDE) since 2005, NSU is a recognized regional and national leader in cybersecurity education. Our distinguished faculty engage students in a unique, interactive learning environment that facilitates academic excellence and prepares our students for their future careers while they earn a B.S., M.S., or Ph.D degree, especially in our cybersecurity programs.

NSU offers three graduate degrees focused on cybersecurity: M.S. in Information Assurance & Cybersecurity (Technical with focus on Network Security Engineering); M.S. in Cybersecurity Management (Managerial with focus on Security Policy Development and Compliance); and Ph.D. in Information Assurance.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Dr. Yair Levy
(954) 262-2006
levyy@nova.edu

infosec.nova.edu

NSU's Cybersecurity Day Outreach for high-school students every October since 2013
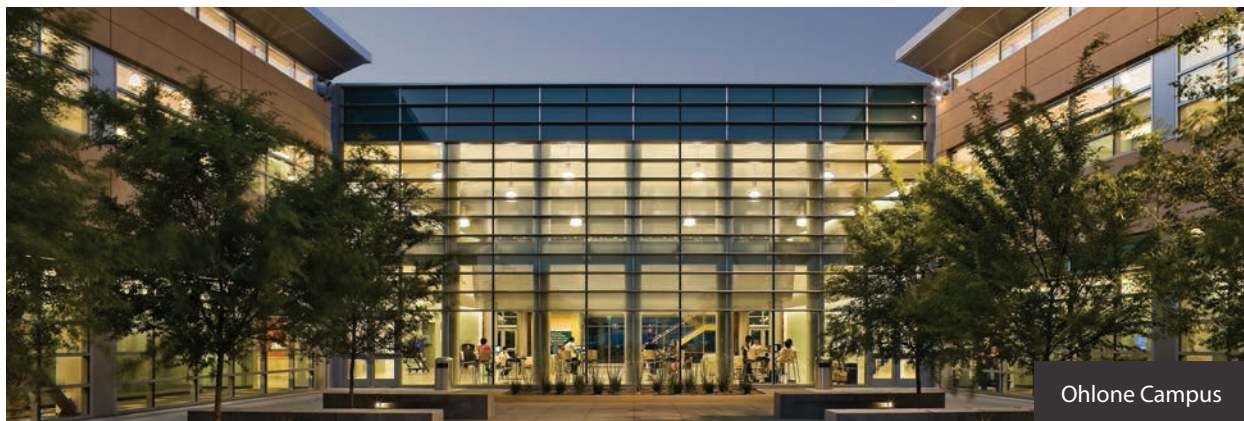
OHLONE COLLEGE

Ohlone Campus

Ohlone College offers high quality educational and career pathways and personal enrichment courses to serve the diverse needs of all students and the community. Ohlone provides excellent instruction and support services, awards associate degrees and certificates, and promotes university transfer in an inclusive, equitable, and multicultural environment where student learning and achievement are paramount. Ohlone fosters innovation, encourages student expression, and promotes ethical behavior and global citizenship.

The Departments of Computer Science and CNET (Computers, Networks, and Emerging Technology) at Ohlone College offer courses that prepare students interested in transferring to a four-year university. Our programs for Associate Degrees and Certificates prepare students for employment in the fields of computers, networking, and emerging technologies. Many of our students go on to pursue successful careers as computer programmers, cybersecurity specialists, business analysts, database administrators, systems administrators, support specialists, network technicians, computer engineers, web developers, and other related positions.

Our CNET Department is a Cisco Network Academy, VMWare Authorized Academy, Palo Alto Network Academy, CompTIA Academy, and Microsoft IT Academy.

Our teaching philosophy is "learning by doing," where students are taught by industry professionals and are given the opportunities to apply their academic studies to generate real-world solutions. In the classroom, our faculty, the majority of whom have deep backgrounds with Silicon Valley technology companies, share their real skills, experiences, and knowledge. Meanwhile, our advisory board consists of industry leaders to ensure that our programs are up to date with cutting-edge industry trends.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Ron Sha
rsha@ohlone.edu

ohlonecs.com
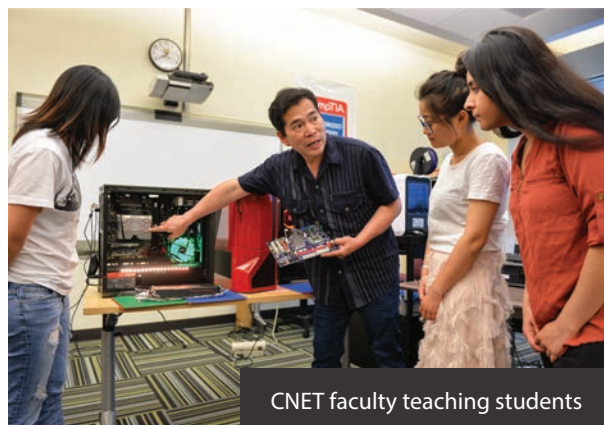
CNET faculty teaching students

OKLAHOMA CITY COMMUNITY COLLEGE

Oklahoma City Community College

Since its inception in 2003, **Oklahoma City Community College's (OCCC)** Cyber/Information Security program strives to prepare students for many in-demand cybersecurity positions. Graduates have obtained positions in both private industry and government positions throughout Oklahoma and surrounding states.

In April 2010, OCCC was among the first six, 2-year institutions to receive the designation as a National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE-2Y). We are proud that OCCC has continued to maintain this designation until 2021. This prestigious designation validates the education received by OCCC students.

OCCC offers an Associate degree and a Certificate of Mastery in Cyber/Information Security. Classes offer an offensive and defensive approach to cybersecurity and topics covered include computer operating systems and hardware, computer programming, database systems, information security principles, network security and administration, secure e-commerce, enterprise security management, and cyber forensics. Students are also prepared for industry preferred cybersecurity related certifications.

OCCC students are provided a hands-on and well-rounded experience to develop their knowledge that is geared towards meeting industry needs. This is achieved through classroom lectures, labs inside and outside the classroom, in-class student presentations, individual and group research projects, guest lectures, Cyber Club meets, and National Cyber League Competitions. OCCC also hosts monthly InfraGard and quarterly Information Systems Security Association (ISSA) to further align its program with industry needs.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Haifeng Ji
(405) 682-1611 Ext. 7381
hji@occc.edu

occc.edu/bit/ccde.html
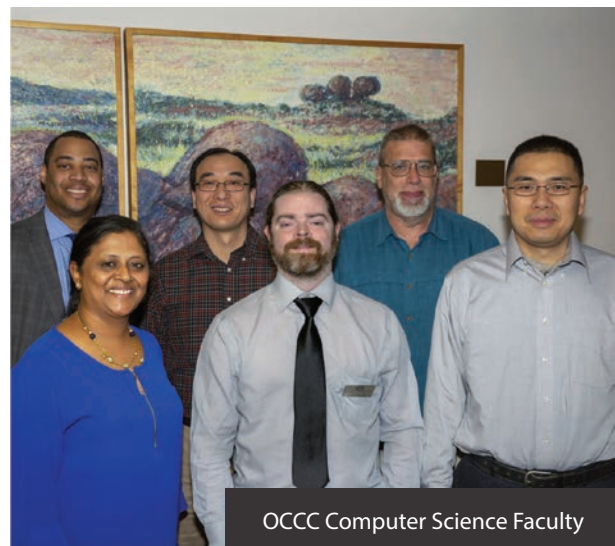
OCCC Computer Science Faculty

OKLAHOMA STATE UNIVERSITY

Oklahoma State University is a land-grant institution with more than 35,000 students across a five-campus system.

Located in Stillwater, Oklahoma, **Oklahoma State University (OSU)** was founded on Christmas Day in 1890 as Oklahoma Agricultural and Mechanical College. OSU has been a designated National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) since 2005 and as a National Center of Academic Excellence in Research (CAE-R) since 2008. OSU was one of the first universities to be awarded the CAE-R designation and was the first university in the country to hold both the CAE-CDE and CAE-R designations simultaneously.

The STEM-certified Management Science and Information Systems department in the Spears School of Business offers cybersecurity degree paths at the undergraduate and graduate levels and also houses the Center for Telecommunications and Networking (CTANS). CTANS was established in 2002 as OSU's focal point for research, teaching, and outreach in information assurance and forensics.

The OSU Information Security and Assurance Club (ISAC), established in 2009, offers students a central location for hands-on cybersecurity experience by way of a dedicated lab in the new Spears School of Business building. ISAC students compete annually in the Collegiate Cyber Defense Competition, act as mentors to the Stillwater High School cybersecurity club, and experience a high degree of interaction with invited guests that often leads to job offers in both government and corporate environments.

Faculty at Oklahoma State University are actively engaged in research, editorial positions, and grant writing in all areas of cybersecurity and invite collaboration with other members of the CAE community.

DESIGNATIONS

- **CAE - Cyber Defense Education**
- **CAE - Cyber Defense Research**

CONTACT INFORMATION

Dr. Jim Burkman
(405) 744-5142
jim.burkman@okstate.edu

ctans.okstate.edu

Students from ISAC compete annually in CCDC with support from the MSIS Department, Spears School of Business and the Center for Telecommunications and Network Security (CTANS).

OLD DOMINION UNIVERSITY

ODU Campus

Old Dominion University (ODU), located in the coastal city of Norfolk, is Virginia's entrepreneurial-minded doctoral research university with more than 24,000 students, rigorous academics, an energetic residential community, and initiatives that contribute $2.6 billion annually to Virginia's economy.

The ODU Center for Cybersecurity Education and Research (CCSER) supports ODU's mission to serve its students and enrich the Commonwealth of Virginia, the Nation, and the world through rigorous academic programs, strategic partnerships, and active civic engagement. The mission of CCSER is to promote cybersecurity research and education in an interdisciplinary setting. The CCSER includes faculty and staff from across all colleges and reporting units at the university, including Information Technology Services, VMASC, and Military Affairs.

Housed in CCSER, the Bachelor of Science - Cyber Operations Major was designated as a CAE in Cyber Operations in 2019. This degree places an emphasis on technologies and techniques applicable to all operational and system levels. Coursework in cyber operations balances theory, practice, and hands-on labs inspired by real-life scenarios. Skills and competencies emphasized are in system attack, infiltration, exploitation, defense, mitigation, and recovery.

ODU students will have the skills and proficiencies that are critical to intelligence, military, and law enforcement organizations authorized to perform these specialized operations, playing a role in the enhancement of the national security posture of the Nation.

DESIGNATIONS

• **CAE – Cyber Operations**

CONTACT INFORMATION

Dr. Michael Wu, Director
(757) 683-4586
h1wu@odu.edu

odu.edu/ccser

Cyber students in lab

OWENSBORO COMMUNITY AND TECHNICAL COLLEGE

OCTC Main Campus

Owensboro Community and Technical College (OCTC) is a public, open access institution in Owensboro, Kentucky. It is one of the 16 colleges that make up the Kentucky Community and Technical College System (KCTCS). The four campuses of OCTC play a vital role in the region for economic development, educational attainment, preparedness for transfer to a university, or transitioning directly to a professional career.

OCTC supports the dynamic Computer & Information Technologies (CIT) Program. The CIT program offers Associate in Applied Science degrees and multiple certificates in the focused areas of information security, programming, network administration, and website development and administration. Graduates of the CIT program are employed at many different organizations throughout the region. In addition, many CIT graduates continue their education at Kentucky colleges and universities that have transfer agreements with KCTCS/OCTC.

The CIT – Information Security (IS) Program earned the CAE in Cyber Defense Education designation in 2019. The IS option provides students with a comprehensive foundation in the principles of cybersecurity, as well as the fundamental knowledge required for entry-level positions in the cybersecurity industry. The IS option covers a wide variety of security analysis/defensive tools and concepts. Students experience hands-on practical assignments that prepare them for the real world. Included in their experience at OCTC are opportunities to participate in service-learning projects where students give back to the community by providing technical expertise.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Theresa Schmitt
(270) 686-4604
theresa.schmitt@kctcs.edu
owensboro.kctcs.edu/education-training/cyber-security

OCTC CIT Students working in lab

Pace University campus

Pace University is committed to excellence in cyber defense education and research. Our undergraduate programs include the Bachelor of Science in Information Technology with a focus in security, and the Bachelor of Science in Professional Technology Studies with a Computer Forensics concentration. Our graduate programs include the Master of Science in Information Technology with a Cybersecurity concentration, the Master of Science in Computer Science with a Web Security concentration, and the Master of Science in Information Systems with an Information Assurance career path.

Pace offers a PhD in Computer Science and many doctoral students focus on cybersecurity related research. In addition, Pace provides cybersecurity scholarships supported by the Department of Defense's Cyber Scholarship Program (CySP) and the National Science Foundation's Scholarship for Service: CyberCorps® Program (SFS). Graduates of these programs become successful cybersecurity professionals holding key positions in the government, the private sector, and academia. Pace's interdisciplinary offerings include the undergraduate minor in Information Assurance in the Criminal Justice System and the Master of Arts in Homeland Security.

Pace maintains three labs focusing on cybersecurity research and education. The Cybersecurity Education and Research Lab brings together faculty research and cyber defense education. Research streams include biometrics, information security management, web security, computer forensics, information technology auditing, intrusion detection, cybersecurity education, and privacy. The Applied Data and Networking Sciences Lab offers students opportunities to develop skills in cybersecurity, networking and data analytics, including preparation for CISSP and CISCO CCNA certifications. The Computer Forensics Lab focuses on research and practical experience in digital and mobile forensics.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Li-Chiou Chen
(914) 773-3907
lchen@pace.edu

pace.edu/seidenberg/cybersecurity-lab

Pace GenCyber Camp

PENN HIGHLANDS COMMUNITY COLLEGE

Penn Highlands Richland Campus

Pennsylvania Highlands Community College is a dominant higher education provider in west central Pennsylvania and a catalyst for regional renewal, positioning our graduates to be recognized as highly competent, exceptional members of the community and workforce. Upon graduation, students are able to demonstrate the fundamental knowledge and integration of ideas, methods, theory, and practice. Pennsylvania Highlands has six locations throughout the Southern Allegheny region that serve residents of western Pennsylvania.

Designated in 2018 for its Associate of Applied Science (A.A.S) in Information Technology: Cyber Security, Penn Highlands provides students with the ability to not only administer networks, but also to secure those networks and conduct penetration tests to ensure they are not vulnerable to attacks.

Students work closely with faculty who maintain current positions within local technology companies and perform cybersecurity work on a daily basis. Faculty affiliations allow students to have direct contact with local organizations when pursuing internship opportunities.

Students cover aspects of the Microsoft Certified Solutions Associate (MCSA), CompTIA Linux+, Net+, Security+ and A+, Wireshark Certified Network Analyst, and the EC-Council Certified Ethical Hacker certifications.

Cybersecurity graduates are expertly trained in computer hardware, operating systems, networking, databases, programming, and defensive and offensive security. They may enter the workforce immediately or transfer to a four-year program at colleges and universities. PHCC has a strong working relationship through articulation agreements with Indiana University of Pennsylvania (IUP) that allow our cybersecurity program students the ability to attend any of their events.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Dr. Kevin Slonka
(814) 262.6481
kslonka@pennhighlands.edu

pennhighlands.edu/cybercenter

Dr. Kevin Slonka, Assistant Professor

PENNSYLVANIA STATE UNIVERSITY

Penn State University Campus

The **College of Information Sciences and Technology (IST) at Penn State University** is focused on solving problems and advancing opportunities that exist at the intersection of information, technology, and people. Students blend knowledge of information technologies— computer programming, discrete mathematics, database concepts, an understanding of information systems—with strong communication skills and teamwork to understand how information technologies can be used in real applications involving individuals, organizations, and national and global organizations. Faculty bring diverse professional expertise to the classroom, challenging students to think critically and work collaboratively to explore innovative solutions that lead to real-world impact. Penn State offers an undergraduate program that teaches students the skills they need to develop new technology and the role that technology will play in our lives, businesses, and the world. Students will be challenged to think critically to solve problems using technology in a variety of contexts. Our programs include a set of courses that provide an understanding of the theories, skills, and technologies associated with network security, cyber threat defense, information warfare, and critical infrastructure protection across multiple venues. Penn State offers two cybersecurity-related certificates: a certificate of recognition and a certification of achievement. Any student who graduates with a major or minor in Security and Risk Analysis, or from the IST Masters program, receives a certificate of recognition. Students who completed the courses as required for the CAE designation receive a certificate of achievement noting their accomplishment. Both certificates verify that the student graduated from an institution and program whose faculty, curricula, and commitment were evaluated and found to be of high quality as defined by the NSA/DHS requirements.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Mike Hills
(814) 852-8383
mkh179@ist.psu.edu

ist.psu.edu

Penn State IST Students

PPCC Rampart Range Campus

Pikes Peak Community College's cybersecurity degree program prepares people for the Cisco Certified Network Associate Security (CCNA Security) certification test or the Computing Technology Industry Association Security+ (CompTIA Security+) certification test. Students can then pursue careers as cybersecurity analysts, information systems security engineers, systems design engineers, and more. Easy job placement and a starting salary of $60,000 a year make this a solid career path. With two new cyber labs at its Rampart Range and Centennial Campuses and an additional cybersecurity lab facility at the Catalyst Campus, PPCC has the capacity to provide affordable, hands-on training to 75 qualified students at a time.

In addition, PPCC's hands-on, non-credit cybersecurity courses are designed to teach experienced hobbyists and IT professionals all they need to know to pass the Network+, Security+ and Certified Ethical Hacker (CEH) exams, the industry standards for anyone wanting to work in cybersecurity. Using brand new cybersecurity ranges, students work through realistic scenarios in the lab. With costs far less than most test-prep boot camps, the PPCC fast-track courses do not count toward a college degree but do come with a voucher to take the industry certification exam at no additional charge.

As part of our effort to become an NSA- and DHS-designated Center of Academic Excellence for Cyber Defense Education, PPCC is now part of both CyberWatch West (CWW), a group of universities and colleges interested in cyber defense and cybersecurity and the National CyberWatch Center, a consortium of higher education institutions, businesses, and government agencies focused on collaborative efforts to advance information security education and research and strengthen the national cybersecurity workforce. PPCC is also a member of the Department of Homeland Security (DHS) Stop.Think.Connect. Campaign.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Terri Johnson
(719) 502-3077
Terri.johnson@ppcc.edu

ppcc.edu/cyber-defense-center

PPCC Centenial Campus

POLYTECHNIC UNIVERSITY OF PUERTO RICO

NSF-Job Fair in Washington, DC - 2018

CTF Competition at Argonne Lab - 2018

In June 2015, **Polytechnic University of Puerto Rico (PUPR)** was re-designated as a National Center of Academic Excellence in Cyber Defense (CAE-CD) until the year 2020, complying to the new standards. PUPR is one of the few HSI's to be re-designated as a CAE-CD and the only one in the island of Puerto Rico. The Institution hosts a competitive Master of Science in Computer Science with a track in Cybersecurity. The Bachelor of Science in Computer Science and the Bachelor of Science in Computer Engineering also offer tracks in cybersecurity. PUPR hosts two graduate cybersecurity certificates: a Graduate Certificate in Information Assurance and Security, and a Graduate Certificate in Digital Forensics. All of these programs service a large, mainly Hispanic, under represented student population. A group of ten students from the PUPR NSF-SFS CyberCorps® program won first place at the international Capture the Flag (CTF) competition called Cyber Fire, sponsored by Lawrence Livermore National Laboratory (LLNL). Over 100 universities in the United States and other countries participated. The SFS Scholarship Program at PUPR is supporting 20 graduate students over a five-year period (2016-2020) to increase research and improve education in technology areas relevant to information assurance and cybersecurity. The program engages students in professional experiences such as internship workshops and research and development. To enrich their academic experience even more, the program also involves them in outreach events and synergistic interactions through various activities in information assurance and cybersecurity such as boot camps, job fairs, symposiums, community outreach, and other SFS sponsored activities. The program helps to increase the number of qualified students entering the fields of information assurance and cybersecurity to protect and defend the cyberspace.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Alfredo Cruz, PhD
(787) 717-3473
alcruz@pupr.edu

pupr.edu/information-assurance-and-security

PUPR Capture the Flag "Cyber Fire" winning team, 2018

Home of PCC's Computer Information Systems program

PORTLAND COMMUNITY COLLEGE

As the largest post-secondary institution in Oregon, **Portland Community College (PCC)** serves nearly 73,000 full-time and part-time students. We offer high-quality education and opportunities for our students, contributing to the vibrancy of Portland's economic community.

Cybersecurity is infused throughout PCC's Computer Information Systems (CIS) programs, where students are encouraged to develop a security mindset. CIS students can earn a Cybersecurity Fundamentals certificate and a Cybersecurity Associate of Applied Science degree, both of which align with the CAE knowledge units. The program encourages students to participate in National Cyber League competitions where they engage in defensive and offensive puzzle-based challenges. A cybersecurity student club affiliated with the National Cybersecurity Student Association conducts monthly meetings featuring everything from sharing competition experiences and tooltips to guest speakers. Faculty are active in the cybersecurity education community, consistently participating in the annual Community College Cyber Summit (3CS) as well as the CAE Community, where they learn how to best prepare students for jobs in the field. Recognizing the need for good cyber hygiene throughout the entire campus, PCC uses cyber road maps with accountability measures to help the institution embrace the urgency of cybersecurity. There is an intentional focus on people and education – from engagement of the President, Board of Directors, and executive leadership to campaigns targeted at students, faculty, and staff. The college actively promotes awareness of security issues among students and staff each October during Cybersecurity Awareness Month.

PCC is educating future professionals to mitigate the shortfall of skilled cybersecurity personnel and applying the lessons students learn to its very own institutional practices.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

CIS Department
(971) 722-4287
cybersecurity-education@pcc.edu

pcc.edu/cybersecurity-education

CIS students collaborate to succeed

PGCC Center for Advanced Technology

PRINCE GEORGE'S COMMUNITY COLLEGE

The Cybersecurity Program at **Prince George's Community College (PGCC)** provides learners with the knowledge and skills required in much sought after positions including data security analysts, systems security administrators, and network security administrators. Students master the latest security technologies and examine issues related to awareness, planning, hardware, software, systems integration, defense, and the legal and ethical issues associated with cybersecurity. Students complete a capstone project, designing and implementing an information security system. Students completing either the Associate of Applied Science degree or certificate program will be able to use the curriculum fundamentals learned to prepare for the CompTIA A+, Network+, Security+, and Cisco Certified Network Associate (CCNA) industry certification exams. There are also a number of transfer agreements in place with area four-year schools.

Prince George's Community College is the headquarters of the National CyberWatch Center, a consortium of higher education institutions, businesses, and government agencies focused on collaborative efforts to advance information security education and strengthen the national cybersecurity workforce.

National CyberWatch continues to be the go-to organization for innovative, scalable, and cost-effective cybersecurity education/training partnerships and solutions. Programs and services include:

• Community College Cyber Summit (3CS)
• Cloud-based Lab Solution
• Curricular Offerings
• Cybersecurity Skills Journal: Practice & Research
• Innovations in Cybersecurity Education Awards
• Membership Packages
• Mid-Atlantic Collegiate Cyber Defense Comp.
• National Cybersecurity Student Association
• Publications via its Digital Press
• Webcast series

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Casey W. O'Brien
(301) 546-0760
obriencx@pgcc.edu

pgcc.edu/programs-courses/
program-finder/cybersecurity-aas

PGCC GenCyber Camp

PUEBLO COMMUNITY COLLEGE

Pueblo Community College Main Campus

The National Security Agency and Department of Homeland Security have designated **Pueblo Community College** a National Center of Academic Excellence in Cyber Defense Education (CAE-2Y) for its cybersecurity program. The designation makes PCC the lone two-year accredited program in southern Colorado. "This designation is the culmination of years of dedication to training, development, education, and promotion of the cybersecurity discipline at PCC," said Jennifer Sherman, dean of business and advanced technology. "We are proud to be a leader in this field as we address the workforce demand and talent pipeline for business and industry."

Tim Gama, director of PCC's cybersecurity program, spent the past year completing the accreditation process. PCC's existing program had to meet stringent criteria to be approved.

"I was so pleased when told that the college had been awarded this distinguished accreditation," said PCC President Patty Erjavec. "I could not be more proud of Tim and his fine efforts to move our cybersecurity program to this level."

Students who complete PCC's 60-credit program will receive an Associate of Applied Science degree in Networking Cybersecurity and will be prepared to test for certification in several areas. They will be able to enter the workforce immediately upon graduation or transfer to a four-year program "We're training today for jobs not yet created," Gama said. "With this designation, the industry will recognize that our students are trained and ready for the cyber industry."

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Tim Gama
(719) 549-3205
Tim.Gama@pueblocc.edu

pueblocc.edu/Programs/CSE

PURDUE UNIVERSITY NORTHWEST

"Advancing Society with Computing"

Purdue University Northwest (PNW) is a student-centered university that values academic excellence, supports growth, and celebrates diversity. Located near Chicago in northwest Indiana, PNW fosters a vibrant academic community through high quality and engaging undergraduate and graduate education.

The PNW College of Technology partners with business, industry, and government to give students opportunities to solve real-world problems, leading to internships and jobs. The majority of our courses are application-oriented and include laboratories with state-of-the-art equipment. The CAE path, BS in Computer Information Technology (CIT) undergraduate program, is accredited by the Computing Accreditation Commission of ABET. The curriculum is designed to follow IEEE/ACM curriculum guidelines, and courses are implemented with extensive hands-on activities and lab practices. Students are prepared with knowledge, skills, and abilities that can be mapped to multiple NICE Work Role Categories (Protect and Defend, Analyze, Operating and Maintain, Secure Provision). The CIT program enrollment is over 220 undergraduate and 30 graduate students.

Additional workforce development is supported through a CyberCorps® Scholarship for Service program sponsored by NSF which prepares highly qualified cybersecurity professionals to be placed in government agencies. CIT faculty members and students are actively engaged in applied research and sponsored projects, including but not limited to cyber-physics system security, machine learning in cybersecurity, IoT system security and GenCyber.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Michael Tu
(219) 989-2035
Michael.Tu@pnw.edu

centers.pnw.edu/cybersecurity

Inspiring the Next Generation of Cyber Stars

RED ROCKS COMMUNITY COLLEGE

Main Campus - Lakewood, Colorado

Since 1969, **Red Rocks Community College (RRCC)** assists students in meeting ambitious career and educational goals in an exciting, collaborative environment with multiple pathways to success. Red Rocks Community College delivers career-enhancing courses, certificate programs, and degrees that represent a solid investment in each student's goals and career success. RRCC embraces the leadership role of providing education that is firmly rooted in real-world applicability. RRCC has a diverse palate of courses including hybrid and online that are facilitated by experienced educators.

The National Security Agency and U.S. Department of Homeland Security designated RRCC as a National Center of Academic Excellence in Cyber Defense for its Bachelor of Science in Secure Software Development, one of the only degrees of its kind in the nation. This degree completes the cybersecurity program at RRCC, being able to offer both security in hardware and networking and secure software development. With this degree, RRCC provides a pathway that is true to our local, state, national, and international communities and supports changing trends as they impact the success of our students' career and educational goals.

The mission of the Computer Technology Department is to prepare students for a successful career in computer information systems by offering industry skills that are in demand through our degree and certificate programs. The department's educational, professional, and sustainability objectives include producing graduates that can secure jobs in a variety of areas, providing internal and external training for faculty, and staying up to date with current technology trends.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Joseph Murdock
(303) 914-6249
joseph.murdock@rrcc.edu

rrcc.edu/cyber

Cybersecurity Club

Regent University – Home of the Institute for Cybersecurity

The demand for computer and information technology occupations is projected to grow by an astounding 12% through 2028 (U.S. Bureau of Labor Statistics). **Regent University** has expanded its areas of study to meet this need. In addition to offering robust programs on campus in Virginia Beach, Virginia, Regent's leading-edge computer, cyber, and IT programs are offered fully online with eight start times per year. These online degree programs are convenient for balancing coursework, a job, and life.

Regent University is proud to be designated as a National Center of Academic Excellence in Cyber Defense Education for its BS in Cybersecurity. In 2017, Regent took a cutting-edge leap and launched a state-of-the-art cyber range training center. In January 2020, CertNexus announced that the Institute for Cybersecurity was named the 2019 Most Innovative Authorized Training Partners of the

Year. Regent is also ranked among top national universities (U.S. News & World Report, 2020) and is top-ranked in Virginia for Best Online Bachelor's Programs.

The school's computer and information technology degree programs integrate knowledge and faith and are highly competitive and marketable. Award-winning faculty teach students to solve sophisticated computational problems, improve processing efficiencies, and explore ethical and social challenges connected to tech and computer-related careers. Regent's cyber experts also help develop student expertise in areas such as network security, identity management, strategic planning, and disaster recovery.

Whether beginning a career or ready to advance, Regent University provides a high-quality, affordable degree. Individuals with strong analytical and ethical aptitudes, as well as transitioning military members, are highly desired.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Cheryl Beauchamp
(757) 352-4772
cherbea@regent.edu

regent.edu/cae-cde
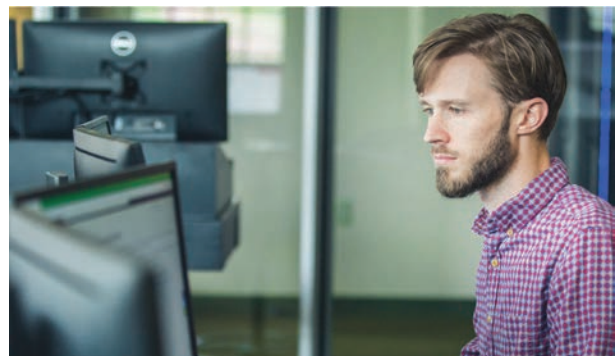
Regent's immersive learning environment provides live-fire scenarios and advanced theory instruction.
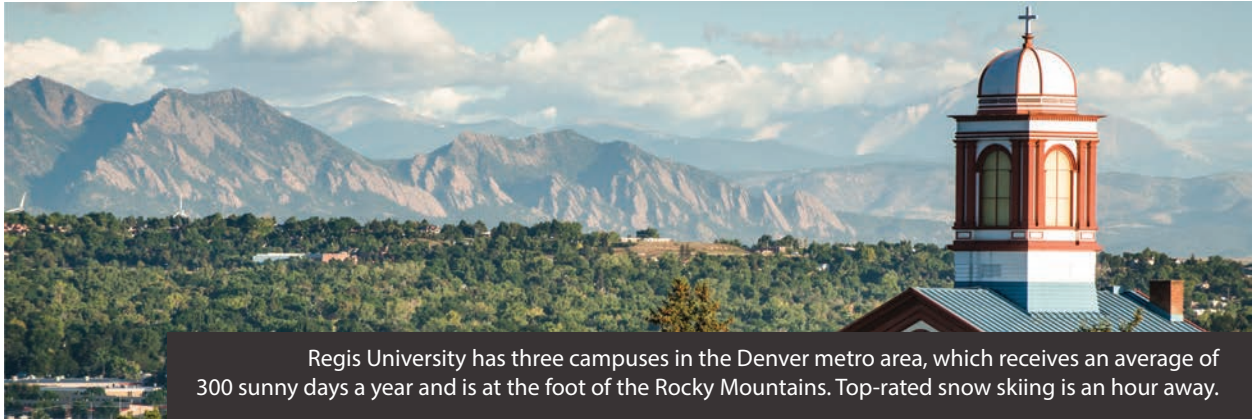
REGIS UNIVERSITY

Regis University has three campuses in the Denver metro area, which receives an average of 300 sunny days a year and is at the foot of the Rocky Mountains. Top-rated snow skiing is an hour away.

With cyberattacks on the rise, employers need qualified professionals who can keep their data and technology protected. Data security and integrity are critical, whether in storage, processing, or transit.

Regis University, located in sunny Denver, Colorado, offers a complete approach to information systems and cybersecurity. Students learn how to protect all levels of confidentiality, integrity, and availability of data in their delivery systems. Pursuing an Information and Cybersecurity Master's degree, students choose from a cybersecurity or policy management specialization, with each geared toward a specific career track. The degree also offers three stackable certificates. Upon graduation, Regis students have the foundational skills and knowledge to sit for many in-demand professional certifications. Classes are offered online, on campus, or a combination of both.

Regis' accredited program is designated as a Center of Academic Excellence in Cyber Defense Education by the National Security Agency and Department of Homeland Security. Our curriculum is modeled on the curricula guidelines of the Committee on National Security Systems' 4000 training standards, the International Information System Security Certification Consortium's Eight Domains of Knowledge, the National Institute of Standards and Technology, and the International Security Audit and Controls Association.

Established in 1877, Regis University is a premier, globally engaged institution of higher learning in the Jesuit Catholic tradition that prepares leaders to live productive lives of faith, meaning, and service. One of 27 Jesuit universities in the nation, Regis has four campuses and extensive online offerings with more than 8,000 students.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Regis University
(800) 388-2366
ruadmissions@regis.edu

regis.edu

Regis University partners with the Colorado Army and Air Force National Guard and the state of Colorado to provide cybersecurity trainings to the public throughout the year.

RMU Campus

ROBERT MORRIS UNIVERSITY

Robert Morris University (RMU) is a nationally ranked non-profit private university located in suburban Pittsburgh, Pennsylvania. RMU is accredited by the Middle States Commission on Higher Education to offer bachelor's, master's, and doctorate degrees. The university provides quality education in cybersecurity and currently offers a Bachelor of Science degree program in Cybersecurity and Digital Forensics and a Master of Science degree program in Cybersecurity and Information Assurance. It is for this Bachelor's degree that earned RMU the designation as a National Center of Academic Excellence in Cyber Defense Education in 2019. RMU also holds three ABET computing accreditations.

The cybersecurity programs and courses at RMU provide students with strong knowledge, skills, and abilities in fundamental and more advanced topics necessary for academic and professional success in the cybersecurity field. The core courses include networking and data communication, computer and network security, information assurance, operating systems, database, intrusion detection, penetration testing, digital forensic analysis, programming such as Python, C, C++, C#, and Java, and a cybersecurity capstone project.

Students in RMU cybersecurity programs have extensive hands-on learning activities for problem solving as well as regular learning activities to develop their skills and competencies in critical thinking, communication, teamwork, and leadership. The coursework also helps students to prepare for professional certifications in cybersecurity, such as Security+, Certified Ethical Hacker (CEH), and Certified Information Systems Security Professional (CISSP).

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Ping Wang
wangp@rmu.edu

rmu.edu

Cybersecurity Course

RIT

Future home of RIT's Global Cybersecurity Institute

Established in 2012 as one of the first academic units in the nation of its kind, the **Computing Security Department at RIT** consists of 16 full-time faculty members and six extended faculty members. The department has approximately 400 students pursuing a Bachelor of Science in Computing Security, 60 students pursuing a Master of Science in Computing Security, and 10 Ph.D. students with a research focus in cybersecurity. RIT has been designated as a CAE-CDE since 2006 and a CAE-R since 2017. CAE designations have propelled the rapid growth of computing security research and education programs at RIT. Student teams at RIT have won the Northeast Collegiate Cyber Defense Competition a total of seven times, and in 2013 they won the national title. RIT is one of the primary universities that offer the NSF CyberCorps® Scholarship.

In 2015, RIT established the first National Collegiate Pentesting Competition. The competition has rapidly grown to comprise three regionals, involving teams from more than 30 colleges and universities nationwide, and will expand to international regions.

In 2016, RIT designated cybersecurity as one of four signature multidisciplinary research areas with a strategic investment of $2 million. Today, with support from a historic donation from alumnus Austin McChord, and a New York State HeCap grant, RIT is building a state-of-the-art facility to host Computing Security degree programs and the Center for Cybersecurity. Experts at RIT are devoted to educating the next generation of highly skilled cybersecurity professionals who will protect our nation's vast cyber infrastructures and digital assets from constant attacks conducted by our adversaries.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Dr. Bo Yuan
(585) 475-4468
bo.yuan@rit.edu

rit.edu/cybersecurity

'The Sentinel' by famed sculptor Albert Paley, stands in the center of RIT's campus

Rockland Community College Campus

Rockland Community College (RCC) of the State University of New York (SUNY) system, offers a safe, supportive learning environment for thousands of students from diverse backgrounds. RCC has become the first choice for parents and students. Our award-winning faculty works closely with students to ensure their success plus numerous student services to help students meet their goals. RCC also serves as a unique and important resource for the community and our cultural offerings attract thousands of community members, and the business community turns to RCC for workforce training and development.

Rockland Community College has a longstanding commitment to cybersecurity education. Rockland was the first community college in the SUNY system to have its courses certified as mapping to the Committee on National Security Systems NSTISSI Standard 4011 in 2008, and was the first to offer a degree in local area networking in 1996. In 2017, RCC became a CAE in Cyber Defense Two-Year Education.

Cybersecurity graduates can transfer to a range of four-year institutions and are eligible to apply for the CyberCorps®: Scholarship for Service. The cybersecurity AAS degree program provides students the technological coursework needed for careers in cybersecurity. RCC cybersecurity courses also prepare students to enter the workforce with many industry-recognized certifications.

Cybersecurity topics are also included in other degree programs. Examples include HIPAA in Nursing and Occupational Therapy Assistant programs, information privacy topics in the Paralegal Studies program, and critical infrastructure protection in the Corporate and Homeland Security program.

The college is a CompTIA Authorized Academy, Cisco Academy, an affiliate school of the National Center for Systems Security and Information Assurance, and a member school of the National CyberWatch Center.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Jeanette Geller
(845) 574-4577
jgeller@sunyrockland.edu

sunyrockland.edu

2019 CyberSeed Competition hosted by University of Connecticut

ROOSEVELT UNIVERSITY

Roosevelt University Campus
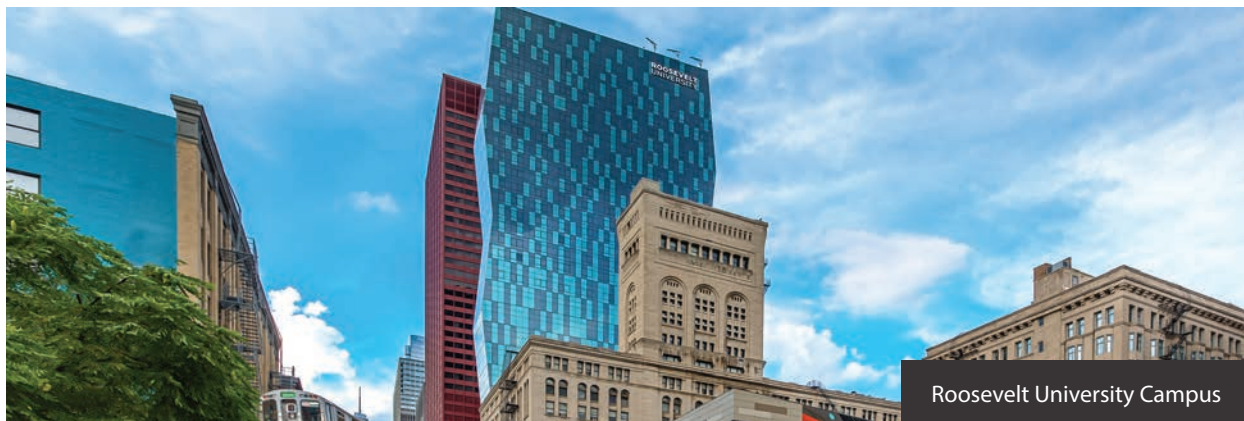
Roosevelt University, located in the heart of downtown Chicago, is a newcomer to the CAE community, having earning CAE-CD status for its Bachelor of Science in Cyber and Information Security in April 2018. Roosevelt was officially designated a National Center of Academic Excellence in Cyber Defense Education (CAE-CD) at a June 2018 ceremony in Huntsville, Alabama.

Through its Center for Cyber Security and Information Assurance (CCSIA), Roosevelt University offers a comprehensive and distinctive range of academic and community activities. The CCSIA hosts a modern cybersecurity research laboratory and an ultra-modern teaching laboratory. The CCSIA sponsors a speaker series, student employment events, and community engagement opportunities for undergraduate and graduate students. CCSIA programs promote professional certifications for students and sponsor a nationally ranked, award-winning competition cyber team, the RU CyberZ, whose members have won gold at local, state, and national competitions.

The involvement of an industry board and alumni board in the CCSIA ensures that the center and its programs remain at the leading edge of theory, practice, and the needs of the field. Roosevelt's BS in Cyber and Information Security degree distinctly combines comprehensive technical curriculum, application, and experience with a broad contextual and historical perspective on the people involved in cyber defense. Students also have the valuable opportunity to combine a CAE-CD program with studies in other disciplines, such as politics, business, and biotechnology, where cyber defense is practiced.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Eric G. Berkowitz
(847) 619-8532
eberkowitz@roosevelt.edu

roosevelt.edu/centers/cyber-security

RU CyberZ winning team members at Capture the Flag competition

SAINT LEO UNIVERSITY
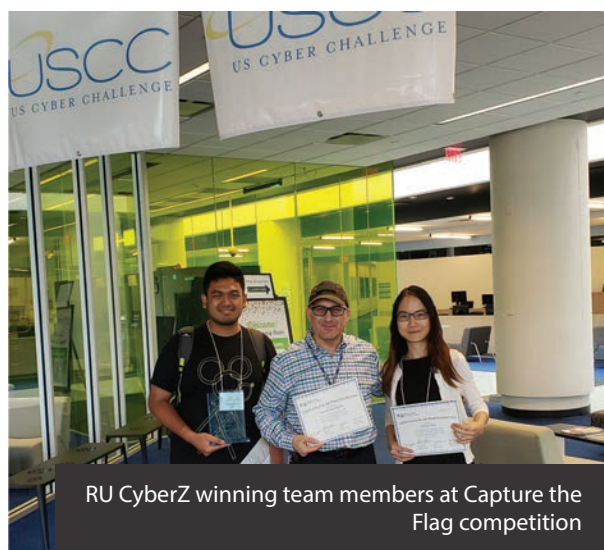
Saint Leo University Campus

Saint Leo University offers traditional-age undergraduates, working adults, and military veterans multiple ways to earn a degree in cybersecurity that will prepare them well for success in the field. Degree programs are available beginning at the associate degree level through the master's degree. Additionally, several degree options are available online or at various regional education centers away from the university's main campus north of Tampa, FL, including locations in Georgia, Virginia, and downtown Tampa.

Starting at the associate degree level, a learner can opt to study at the university's main campus or online. Those graduates can continue their studies and enroll in the Bachelor of Science program, offered at the main campus (on a daytime schedule or with weekend and evening classes), online, or at some centers in Georgia and Virginia. Students new to Saint Leo (without the AA) may apply for direct admission into the four-year program as well. The most advanced degree available, the Master of Science, is similarly available at the main campus, online, in downtown Tampa, and at Virginia locations. The master's curriculum is aligned with requirements set by the National Security Agency as well as with requirements for many industry certifications.

The National Security Agency and the Department of Homeland Security have designated Saint Leo University as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) through 2021.

Saint Leo is private, nonprofit university, founded by Catholic educators, and open to people of all backgrounds.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Derek Mohammed
derek.mohammed@saintleo.edu

saintleo.edu/center-for-cybersecurity-education

Saint Leo Cybersecurity Students

SAN ANTONIO COLLEGE

San Antonio College Entrance

San Antonio College (SAC) is one of five public, open-enrollment community colleges that serve the city of San Antonio and 11 surrounding counties in South Central Texas. SAC is the largest single-campus community college in Texas and one of the largest in the United States, educating approximately 20,000 credit-seeking students each year. SAC serves as a Regional Resource Center for current designees and prospective Centers of Academic Excellence (CAE) institutions. SAC is one of only two community colleges in San Antonio that are designated a National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE-2Y), a National Security Agency (NSA) and Department of Homeland Security (DHS).

The college's Computer Information Systems (CIS) Department – originally established as the Data Processing Department in 1953 – has held CAE-2Y certification since 2013, documenting the relevance and high quality of its Associate of Applied Science (AAS) degree in Information Assurance and Cybersecurity. CIS department courseware has been reviewed by nationally known IA subject matter experts as part of the NSA's Information Assurance Courseware Evaluation (IACE) Program and meets all of the elements of the Committee on National Security Systems (CNSS) National Training Standard for Information Systems Security (INFOSEC) Professionals (NSTISSI No. 4011) and Senior Systems Managers (CNSSI No. 4012).

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Troy Touchette
(210) 486-1050
ttouchette@alamo.edu

www.alamo.edu

SAN JOSÉ STATE UNIVERSITY

Powering Silicon Valley

San José State University (SJSU) is dedicated to training cybersecurity professionals to serve the industry throughout Silicon Valley. Our goal is to grow cybersecurity capacity to match economic development in the San Francisco Bay Area.

In 2014, SJSU and Cisco Systems, Inc. jointly developed and launched a Master of Science in Software Engineering with Specialization in Cybersecurity degree. Since Fall 2017, the program has been made available to professionals and organizations throughout Silicon Valley. As of March 2019, we have enrolled 115 students in this program. Students gain hands-on experience in design, development, testing, and deployment of secure systems, as well as a solid understanding of organizational risk management and records integrity.

SJSU also provides training courses for professional cybersecurity certificates such as Certified Information Systems Security Professional, Certified Information Security Manager, and Certified Information Systems Auditor through cybersecurity training partners.

SJSU has hosted CyberAware Day in collaboration with UC Merced and industry partners for the past two years. This event is intended to increase awareness in the cybersecurity sector and related opportunities for all students, especially those from a diverse background. Industry experts with first-hand knowledge share stories of how they found their way into cybersecurity. In addition to partnering with the City of San Jose and local non-profits, SJSU engages globally with cybersecurity professionals through collaborations with Peerlyst and academic partners such as Zurich University of Applied Science.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

(408) 924.2670
bigdata-center@sjsu.edu
cybersecurity-center@sjsu.edu

sjsu.edu/cybersecurity

Expanding cybersecurity awareness to a broadly diverse student body

SINCLAIR COMMUNITY COLLEGE

Sinclair Dayton Campus

Sinclair Community College is an urban community college located in downtown Dayton, Ohio. Founded in 1887, it is one of the oldest community colleges in America, and the region's choice for post-secondary education. Sinclair Community College was first designated as a Center of Academic Excellence in Cyber Defense in 2011. Sinclair has maintained that CAE-CD designation while continually growing in the cyber field. Cyber defense is a major focus in the Miami Valley region due to proximity of Wright Patterson Air Force Base, defense contractors, and strong local healthcare providers. The college offers classes in many formats including traditional classroom and competency based online to serve our diverse student population. Sinclair utilizes a sandbox learning environment to train students in defending against popular cyber-attacks.

In 2019, Sinclair was awarded the first Scholarship for Service grant ever awarded to a community college to train students in cyber defense. Similarly, in 2017, Sinclair was awarded a grant from the NSA to help build hands on learning environments. Students now can use current enterprise level IT equipment in the classroom. The college has a new state of the art facility to teach cyber defense. Sinclair faculty has developed in-demand curriculum influenced by employer input and industry certifications such as CompTIA, Cisco, TestOut, and Microsoft.

Many graduates of Sinclair continue their education at one of our partner universities or they enter the local cyber defense workforce. The CAE-CD designation adds credibility to our program and is highly valued in the Miami Valley region.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Kyle Jones
(937) 512-2142
kyle.jones4990@sinclair.edu

sinclair.edu

Sinclair Cybersecurity Course

SNEAD STATE COMMUNITY COLLEGE

Snead State Community College

Snead State Community College, a member of the Alabama Community College System, is dedicated to excellence in meeting the educational needs of those we serve through the completion of degree and certificate programs, workforce development, and community engagement. Founded in 1898, Snead State is the oldest community college in the state of Alabama to award the associate degree.

Snead State Community College is recognized as an outstanding comprehensive college of distinction where caring faculty and staff serve to awaken students' passion for learning. Through immersion in a welcoming learning environment that values diversity, experiential learning, and leadership development, our graduates become productive and engaged citizens who make a positive difference in their community.

The Computer Information Systems program at Snead State Community College is designated as a Center of Academic Excellence in Cyber Defense Education through the Department of Homeland Security and the National Security Agency. The Computer Information Systems degree program is also an EC Council Accredited Training Center and Testing Center.

Students can earn a two-year Associate in Applied Science degree or a certificate after five semesters in one of the following areas: cybersecurity, network security, server administration, computer virtualization, and network infrastructure. Short-term certificates are available in IT administration and cybersecurity. Students will be trained to earn industry certifications in the following areas: CompTIA A+, CompTIA Net+, CompTIA Security+, EC Council Certified Ethical Hacker (CEH), Microsoft Certified Systems Administrators, Linux+, and VMware Enterprise Virtualization.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Greg Randall
(256) 840-4166
greg.randall@snead.edu
snead.edu/academics/cis_center_for_academic_excellence.aspx

Members of Snead State's Cyber Team

SOUTH CAROLINA STATE UNIVERSITY

Engineering and Computer Science Complex

South Carolina State University is the first Historically Black College and University (HBCU) in South Carolina to hold the National Center of Academic Excellence in Cyber Defense Education through its Bachelor of Science in Computer Science with cybersecurity curriculum. This curriculum is primarily designed for our computer science majors and is housed in the Computer Science and Mathematics Department. Students in this curriculum complete all required computer science courses along with seven cybersecurity courses (18 credit hours). The courses in cybersecurity are designed to introduce majors to the important field of cybersecurity.

Most of the courses, especially the cybersecurity courses, include hands-on and virtual laboratory experiences. The curriculum covers programming, data structures and algorithms, programming language, social implications of computing, digital logic and computer architecture, database management, computer networks, software engineering, operating systems, computer forensics, cryptography and network security, application and data security with privacy, and a senior design/capstone.

The goal of South Carolina State University's Center of Excellence in Cybersecurity is to address the problem of the lack of awareness and participation in cybersecurity using a multi-tier approach to Cybersecurity Education, Training, and Awareness in the undergraduate curriculum (CSETA). South Carolina State University's Center of Excellence in Cybersecurity located in the Department of Computer Science and Mathematics serves as the focal point for all cybersecurity academic activities. The computer science program at SC State University is accredited by the Computing Accreditation Commission of ABET.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Nikunja Swain
swain@scsu.edu
(803) 536-8675

mcs.scsu.edu/cybersecurity

Program Students, Faculty, and Staff

SOUTH TEXAS COLLEGE

STC Pecan Campus

Founded in 1993, **South Texas College (STC)** offers more than 120 degree and certificate options, including associate degrees in a variety of liberal art, social science, business, math, science, technology, advanced manufacturing, and allied health fields of study. Additionally, STC is the only community college in the state of Texas to offer five baccalaureate degrees. South Texas College has a faculty and staff of more than 2,700 to serve the college's five campuses, two higher education centers, and one virtual campus.

The cybersecurity degree at STC is designed for students interested in entering the field of cybersecurity technologies. The program prepares students to learn practices that are designed to protect networks, computers, programs, and data from attack, damage, or unauthorized access. Our students learn about computer security, installing security software, network monitoring for security breaches, and responding to cyber-attacks. Our students have the opportunity to obtain industry certifications in the areas of networking, security, and digital forensics. Our academic partnerships with organizations like EC-Council, Cellebrite, CompTIA, Microsoft, and Cisco, allow us to provide better opportunities to our students at South Texas College.

We are proud to support our community and our local law enforcement agencies in different ways. At South Texas College, we support our K-12 schools by conducting multiple events that will create security awareness. We recently started cybersecurity academies at some of the high schools in the Rio Grande Valley to support those students who would like to pursue a career in this rewarding in-demand field. We are always innovating to make sure our students obtain the highest quality education they deserve.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Francisco Salinas
(956) 872-6277
fsalinas@southtexascollege.edu

southtexascollege.edu

STC Cybersecurity Program

SOUTHERN MAINE COMMUNITY COLLEGE

Southern Maine Community College sits on a peninsula of land that was Fort Prebble built in 1808. SMCC has a lighthouse and its very own beach along with two residence halls which can accommodate about 450 students.

Southern Maine Community College's Cyber Security program has been designated as a Center of Academic Excellence in Cyber Defense Education, through academic year 2024.

The Cyber Security Program is an Applied Associate of Science two-year degree which can be taken all online or in person utilizing many of our cloud learning environments.

The Cyber Security program gives students an opportunity to train in one of the fastest-growing areas in Information Technology, known as Information Security and Security Assurance. Career opportunities for graduates include: Information Security Analyst, Incident Responder, Network Security Engineer, Chief Information Security Officer, Information Security Architect, and Forensics Analyst. The program covers a wide range of topics including computer forensics, ethical hacking, laws, policies, network security, and physically securing systems in a data center. The curriculum is designed to aid students in preparing for many of the certification exams in the field. The curriculum will include hands-on experience using many cloud environments along with simulation training and group/team-based learning to simulate a professional work environment.

The curriculum is designed to prepare students for the most popular certification exams, which include:

- CCENT
- CCNA
- CISSP
- CompTIA Network+ Computing Technology Industry Association
- CompTIA Security+ Computing Technology Industry Association
- EC-Council Certified Computer Forensics Examiner
- EC-Council Certified Ethical Hacker

DESIGNATIONS

- **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Wendy Plourde
(207) 741-5765
wplourde@smccME.edu
**smccme.edu/academics/degree-programs/
computer-information-security**
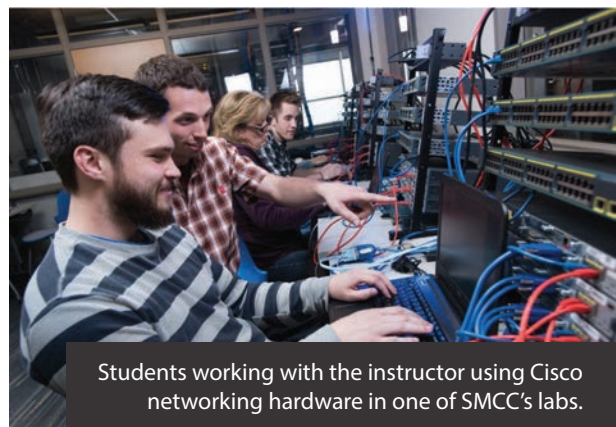
Students working with the instructor using Cisco networking hardware in one of SMCC's labs.

SOUTHERN METHODIST UNIVERSITY

Southern Methodist University Campus

The **Department of Computer Science at Southern Methodist University (SMU)** offers academic programs related to security.   The B.S. degree in Computer Science offers a security track option, which facilitates a more in-depth study of computer and network security issues. Students in this track cover core computer science topics, then take advanced courses that focus on security-related topics.

The M.S. Cybersecurity degree covers the design and development of secure systems and applications, including security of computer networks and systems as well as physical security. In addition to the technical aspects such as cryptography, protocols and access control, the curriculum deals with the policy and management issues, integration and logistics, and budgeting. Centering on the problems of working professionals in the critical field of security, the program in security engineering serves the needs of both full-time and part-time students.

In addition to academic programs in security, SMU also houses the Darwin Deason Institute for Cyber Security. The mission of the Institute is to advance the science, policy, application, and education of cybersecurity through basic and problem-driven, interdisciplinary research. The Institute is committed to the goal of emerging as a world-class cybersecurity research center that innovates, develops, and delivers solutions to the nation's most challenging cybersecurity problems. The underlying philosophy guiding Institute activities is based on establishing a foundational science of cybersecurity through adoption of a broad, interdisciplinary approach for solving cybersecurity problems.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Theodore Manikas
(214) 768-3099
manikas@smu.edu

smu.edu/Lyle/Departments/CS

The Darwin Deason Institute for Cyber Security

SOUTHWEST VIRGINIA COMMUNITY COLLEGE

SWCC Campus

Southwest Virginia Community College (SWCC) is a comprehensive two-year institution, providing quality education and cultural enrichment opportunities for lifelong learners, workforce, and community. The college began serving the region in 1967 and was designated as a National Center of Academic Excellence in Cyber Defense Education in 2019. The Career Studies Certificate in Cybersecurity at SWCC is designed to introduce students at the basic level of study by beginning with the fundamentals. In fall 2020, students will have the opportunity to work in the newly redesigned onsite SWCC cybersecurity lab on the main campus.

Our continued mission is to provide information technology and cybersecurity education supporting the local, regional, and national workforce with training excellence. Students have the opportunity to complete the program 100% online or complete

some coursework on the main campus. The program begins with CompTIA IT Fundamentals and continues with A+, Security+, and Network+. The coursework includes in-depth study of topics such as incident response, cyber laws, and system architecture. In completion of the courses, students experience virtual labs which allow the practice and development of skill sets with the cybersecurity focus. The program also provides additional community outreach such as K-12 cybersecurity and STEM camps and a cybersecurity event within the annual SWCC Business Contest.

Students planning to transfer are advised to also complete the Associate of Applied Science in Information Systems Technology degree which shares some of the same courses as the career certificate program.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Crystal Dye
(276) 964-7250
crystal.dye@sw.edu

sw.edu/cybersecurity-center

Cybersecurity Faculty

Community Colleges of Spokane
Spokane Falls Community College

SFCC Campus

Spokane Falls Community College (SFCC) is an urban community college west of downtown Spokane, Washington overlooking the bucolic Spokane River. Founded in 1964 as an extension of Spokane Community College, SFCC has become a destination for post-secondary education in eastern Washington, particularly in the fields of science, technology, math, engineering, and liberal arts. As a leader in cybersecurity education in the Spokane region, the Falls campus began offering cybersecurity classes in 2005. Today, students have a choice between a two-year Associate of Applied Science degree in information technology with an emphasis in cybersecurity and a four-year Bachelor of Applied Science degree in cybersecurity. Additionally, students have access to three separate one-quarter certificate programs in cyber defense, and a year-long certificate program in computer forensics/network security.

In 2019, SFCC was officially designated by the National Security Agency and the Department of Homeland Security as a National Center of Academic Excellence in Cyber Defense Education. This official designation has allowed faculty and staff to offer additional classes and degrees. SFCC is one of only eight colleges in Washington state and one of two east of the Cascades in Washington to have received this federal designation. Many SFCC graduates continue their education at one of the multiple universities in the Spokane area, including Eastern Washington University, Gonzaga University, Whitworth University, and Washington State University in Pullman.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

Brady Nielsen
(509) 533-3434
Brady.Nielsen@sfcc.spokane.edu

sfcc.spokane.edu

SFCC CMS Students

ST. CLOUD STATE UNIVERSITY

St. Cloud State Campus

St. Cloud State is one of the largest public universities in Minnesota with more than 14,000 students. The university is located northwest of Minneapolis between downtown St. Cloud and the Beaver Islands, a group of more than 30 islands that form a natural maze for a two-mile stretch of the river. The St. Cloud metropolitan area is 24th on Forbes magazine's "Best Small Places for Businesses and Careers." St. Cloud State is ranked in Forbes magazine's "America's Top Colleges." Students can choose from more than 200 majors, minors, and pre-professional programs.

The School of Graduate Studies offers more than 60 programs, including doctoral degrees in Higher Education Administration and Educational Administration and Leadership, as well as a Master of Business Administration from the acclaimed Herberger Business School.

The comprehensive **Master of Science Information Assurance (MSIA)** program prepares students to be experts in information assurance. They are equipped with information security technologies and knowledge to protect the nation's information infrastructure, conduct advanced research, and develop skills in both management and technical areas. Students can choose the **5-Year Track Information Systems and MSIA**, completing both the Information Systems undergraduate major and Master of Science in Information Assurance in five years.

Students who major in cybersecurity will find themselves working on issues with global impact in a field that continuously evolves. They'll learn to assess the security needs of a computer and network system, recommend safeguards and manage the implementation and maintenance of security devices, systems and procedures to protect it. They'll study databases and programming and the theories on computer networks and security and how to apply them to real-world problem solving. And, they'll learn to think critically and be creative and innovative in solving problems that arise in this ever-changing field.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Mark B. Schmidt
(320) 308-4988
mbschmidt@stcloudstate.edu

stcloudstate.edu/cias

Take part in research projects with faculty

ALAMO COLLEGES DISTRICT
St. Philip's College

SPC Campus

Founded in 1898, **St. Philip's College** is a comprehensive public community college whose mission is to empower our diverse student population through educational achievement and career readiness. As a Historically Black College and Hispanic Serving Institution, St. Philip's College is a vital facet of the community, responding to the needs of a population rich in ethnic, cultural, and socio-economic diversity.

St. Philip's College is designated as a National Center of Academic Excellence in Cyber Defense Two-Year Education through academic year 2020 for its Associate of Applied Science in Information Technology Cybersecurity Specialist. This degree prepares students to design, implement, and secure computer networks. Students with this degree will be able to install security software, monitor networks for security breaches, respond to cyber-attacks, and gather data and evidence to be used in prosecuting cybercrime.

Completion in this program prepares a student for industry certifications such as CompTIA Security+, Certified Security Professional (CSP), and Certified Ethical Hacker (CEH).

St. Philip's College seeks to engage its students in unique ways; one of these is through their Cyber Tigers Club. This club is a group of students who are interested in all things technology. The Cyber Tigers activities complement courses in networking, Microsoft applications, Linux, and security to form a unique club that helps channel schoolwork into real-world scenarios and experiences. The Cyber Tigers take part in IT conferences and inter-collegiate competitions, and help spread the word about the wonderful opportunities available in IT through STEM events.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Tom Sahin
(210) 486-2486
hsahin@alamo.edu

alamo.edu/spc

SPC GenCyber Camp

SPC Midtown Center

ST. PETERSBURG COLLEGE

St. Petersburg College (SPC), Florida's oldest community college, has been the anchor institution for higher education in Pinellas County since 1927. Serving more than 47,000 students annually, SPC empowers students by offering educational opportunities and support that will help them achieve success and economic mobility. SPC elevates the community by providing an educated and skilled workforce and it's graduates rank highest in entry-level wages among Florida community college graduates.

Located in Tampa Bay, SPC strives to remain on the forefront of cutting-edge curriculum and technology to meet workforce demand. The College of Computer Information and Technology (CCIT) at SPC offers a certificate and Associate of Science degree in Cybersecurity and a Bachelor's in Applied Science (BAS) in Technology Management with a

cybersecurity (ISA) subplan. These offerings are among the most rapidly growing programs at St. Petersburg College, enrolling more than 400 students in the 2017-2018 academic year. In fall 2019, CCIT launched a BAS Technology Management subplan in Software Assurance and in spring 2020, a subplan in Cyber Defense and Risk Mitigation. A new BAS degree in Cybersecurity has been approved to begin fall 2020.

In 2019, SPC received designation as a National Center of Academic Excellence in Cyber Defense. SPC's cybersecurity graduates meet the growing need for college-educated specialists who can tackle increasingly complex information technology security concerns. Demand will remain high for information security analysts who can stay a step ahead of hackers. The SPC Cybersecurity Club, TitanSec, participates in local, regional, and online Capture the Flag competitions, including the National Cyber League.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Laura Malave
(727) 398-8285
malave.laura@spcollege.edu

spcollege.edu

Information Technology class at SPC taught by Laura Malave, SPC Academic Chair.

Stevens Institute of Technology Campus

STEVENS INSTITUTE OF TECHNOLOGY

Stevens Institute of Technology is a premier, private research university situated in Hoboken, New Jersey overlooking the Manhattan skyline. Since its founding in 1870, technological innovation has always been the hallmark and legacy of Stevens' education and research. Within the university's three schools and one college, 6,900 undergraduate and graduate students collaborate closely with faculty in an interdisciplinary, student-centric, entrepreneurial environment.

Academic and research programs spanning business, computing, engineering, the arts and other fields actively advance the frontiers of science and leverage technology to confront the most pressing global challenges. The university is consistently ranked among the Nation's elite for return on tuition investment, career services, and the mid-career salaries of alumni.

Cybersecurity and information security are very high priorities at Stevens. We work to keep the university's systems and information safe, while simultaneously keeping our users safe while they use technology. Information Technology is charged with the development and execution of Stevens' cybersecurity and information security strategy, corresponding systems, preemptive audits, user awareness programs, and support services.

Stevens offers a wide variety of cybersecurity focused degree programs (at the Bachelor, Masters, and PhD levels) across all three schools. Stevens has held the designation as a National Center of Academic Excellence in Cyber Defense Education for its Bachelor of Science in Cybersecurity Program since 2003. In 2008, Stevens was one of the first schools to also receive the designation as a National Center of Academic Excellence in Cyber Defense Research.

DESIGNATIONS

• CAE - Cyber Defence Education
• CAE - Cyber Defence Research

CONTACT INFORMATION

Susanne Wetzel
(201) 216-5610
swetzel@stevens.edu

stevens.edu

SYRACUSE UNIVERSITY

Syracuse University Campus

Founded in 1870, **Syracuse University** is a private research university of extraordinary academics, distinctive offerings, and an undeniable spirit. Syracuse is recognized as a student-focused, global research university, renowned for academic rigor, richly diverse learning experiences, and a spirit of discovery. Orange was voted in as Syracuse University's official color in 1890. Today, orange isn't just a color—it's a way of life. Syracuse University's main campus sits on top of a hill overlooking the city of Syracuse, in central New York state.

Additional centers are located in New York City, Washington D.C., and Los Angeles, and study abroad programs are available in 60 countries throughout the world, enabling students to gain a global perspective as they pursue their studies. Infused with a strong entrepreneurial culture, the University

is home to over 30 research centers and institutes spanning disciplines from performance, design, fine arts, and humanities to information, health and social sciences, and STEM (Science, Technology, Engineering, and Mathematics) fields.

Students can choose from more than 200 majors, 100 minors, and 200 advanced degree programs across Syracuse's 13 academic units. Syracuse originally received its CAE designation in 2001 and was re-designated in 2004, 2007, and 2012. Syracuse also received its CAE-R in 2009. The University received the new designations in both Education and Research in 2014 that are effective through 2021.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Dr. Joon S. Park
(315) 443-6887
jspark@syr.edu

cisat.syr.edu

Computer Science student

Tennessee Tech University Campus

The Cybersecurity Education, Research and Outreach Center (CEROC), virtually established in October 2015 and physically established in January 2016 at **Tennessee Tech University**, is a Center of Academic Excellence in Cyber Defense. The center was established by the Department of Computer Science and the College of Engineering to integrate university-wide existing activities and initiatives in cybersecurity education, research, and outreach, the emphasis of which makes it unique in the state.

CEROC was awarded the CyberCorps®: Scholarship for Service grant in December 2015 with the title of Tennessee CyberCorps: A Hybrid Program in Cybersecurity. Tennessee Tech was the first university in Tennessee to be awarded the opportunity to manage this prestigious scholarship and remains the largest such program in the state.

The primary focus of the program is to graduate cyber workforce ready candidates with integrated experiences in education, research, and outreach. Tennessee Tech was one of 10 institutions in the nation to participate in the SFS community college pilot. As of 2018, CEROC also participates in the DoD Cyber Scholarship program.

CEROC supports a number of professional development, mentoring, and leadership building opportunities through the CyberEagles student cyber club and the affiliated CTF, defense and offense cyber interest (competition) groups. The new CEROC Cyber Range plays a key role in all competition, educational, outreach, and research programs facilitating dynamic creation of viable cyber environments.

Tennessee Tech, located in Cookeville, TN, is the #1 public university in Tennessee in Best Colleges for Your Money by Money Magazine for the past two years. Tennessee Tech has an R2 doctoral Carnegie classification.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Ambareen Siraj
(931) 372-3519
ceroc@tntech.edu

tntech.edu/ceroc

Cyber (Eagles) Range

TERRA STATE COMMUNITY COLLEGE

Terra State Community College Campus

Terra State Community College has proudly served northwest Ohio as a leading educational institution for 50 years. We are accredited, state supported, and provide our community members educational experiences that are both accessible and affordable. We pride ourselves in helping students reach their goals while staying true to the community college mission of providing open access to higher education.

Terra State offers two degree programs, Associate of Applied Science Computer and Information Systems and Associate of Applied Science Systems and Networking Support, which map to the CAE Cyber Defense curriculum. Both of these programs cover the following industry-level certificates integrated into our curriculum: CompTIA A+, CompTIA Security+, Cisco CCNA Routing and Switching, CPCT

– Certified Premises Cabling Technician via the Fiber Optics Association, CFOT – Certified Fiber Optic Technician via the Fiber Optics Association, and the Microsoft Server Exam 70-410.

Recently, Terra State finished upgrading a second cybersecurity lab for students to work on Red Team/ Blue Team simulations. The lab is separate from the college's network and administered by students. The setup allows for students to get real-world experience wiring a fiber lab as well as administering users, permissions, and security over a network.

In April of 2019, Terra State hosted the 2019 Great Lakes Regional Cisco Academy Conference. Breakout sessions covered a wide variety of topics such as automotive cybersecurity, coding labs, and Wireshark tips and tricks. Many speakers presented, including the founder of Chappell University and CEO of Wireshark University, Laura Chappell.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Haley Crabtree
(419) 559-2314
Hcrabtree01@terra.edu

www.terra.edu

Michael Daigneault and Haley Crabtree

Texas A&M University Campus

TEXAS A&M UNIVERSITY

Texas A&M University pursues teaching, research, and service at the exceptionally high levels expected of America's great universities. Seeking to advance the collective cybersecurity knowledge, capabilities, and practices, through ground-breaking research, high-impact education, and mutually beneficial partnerships, our mission is to enhance national security through research and education. Texas A&M University stands committed to making significant contributions through the development of transformational cybersecurity advancements.

Education:

Texas A&M University has a long history of providing information assurance and cybersecurity education, dating back to the mid-1990s. Today, in our undergraduate and graduate programs, students have an increasing number of interdisciplinary, high impact, and innovative opportunities available to expand their cybersecurity knowledge and skills. Our students upon graduation are prepared for the challenges they will face in their personal and professional lives.

Research:

As one of the world's leading research institutions, and one of only 17 institutions to hold the triple designation as a land-grant, sea-grant, and space-grant institution, Texas A&M is at the forefront in making significant contributions to scholarship and discovery, including that of science and technology. With world-class researchers and state-of-the art facilities, we are leaders in cybersecurity innovation. The combination of great faculty, great facilities, and great students ensures that A&M is moving to the forefront of cybersecurity research and education.

DESIGNATIONS

• CAE - Cyber Defense Education
• CAE - Cyber Defense Research
• CAE - Cyber Operations

CONTACT INFORMATION

Dr. Daniel J. Ragsdale
(979) 845-7398
rags@tamu.edu

cybersecurity.tamu.edu

Texas A&M Cyber Students

TEXAS A&M UNIVERSITY CORPUS CHRISTI

Texas A&M University-Corpus Christi Campus, "The Island University"

Texas A&M University-Corpus Christi is an expanding, doctoral-granting institution committed to preparing graduates for lifelong learning and responsible citizenship in the global community. We are dedicated to excellence in teaching, research, creative activity, and service, offering more than 80 of the most popular degree programs in the state.

Texas A&M University-Corpus Christi has been ranked among the Top 50 Colleges for Hispanics Students by Best Colleges (www.bestcolleges.com). The University ranked 10th in the state of Texas and 37th in the nation the best university for Hispanic students. These rankings were based on academic quality, affordability, and online competency in 2018. The Department of Computing Sciences offers Bachelor in Computer Science, Master in Computer Science and Geographic Information Science, and Doctor of Philosophy in Geospatial Computing.

To complete a Bachelor of Computer Science degree with the Cybersecurity and Infrastructure concentration, students must complete 40 credit hours of Computer Science courses and 39 credit hours of Cybersecurity related courses. The majority of the cybersecurity courses emphasize hands-on activities, where students learn to use open source and commercial applications. The program prepares students to obtain industrial certificates in cybersecurity and internship program helps students to gain valuable experience in the real world. The Cyber Defense Team (student organization) teaches its members offensive and defensive security tactics from beginner to expert level. The team prepares and recruits students to participate in cybersecurity competitions. In the past, students have participated in the National Cyber League, Panoply, MITRE Cyber Challenge, and CAHSI Hackathon.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Saman Desilva
(361) 825-3831
saman.desilva@tamucc.edu

cyberdefense.tamucc.edu

TAMUCC students in the cybersecurity program

TEXAS STATE TECHNICAL COLLEGE

TSTC Campus

Texas State Technical College (TSTC) is a public institution of higher education and a state agency, established through Chapter 135 of the Texas Education Code. Prior to the consolidation into a single SACSCOC accreditation in 2015, TSTC was organized into four vertically integrated colleges with a governing system office. Today, it operates as a single state-wide college with 10 campuses across Texas.

TSTC offers courses of study in technical-vocational education for which there is demand within the state of Texas to include cybersecurity. The Cybersecurity Associate of Applied Science degree program (formerly the Computer Networking & Security Technology program) in Harlingen is located in Texas' lower Rio Grande Valley, and is designated as an NSA/DHS National Center of Academic Excellence in Cyber Defense.

In fall 2019, the Harlingen cybersecurity program was aligned with five other state-wide campuses, located across the state at Ft. Bend County (Rosenburg), Waco, East Williamson County (Hutto), North Texas (Red Oak), and Marshall, expanding the CAE recognized curriculum across the state. Plans for gaining CAE recognition state-wide are underway. The cybersecurity program at TSTC prepares students for employment in a variety of entry level careers in cybersecurity with a strong emphasis on practical hands-on training necessary to equip students with the skills employers expect. Students in the program gain the skills and knowledge required to prevent, defend, detect, and respond to cyberattacks and threats. They are trained to install and configure network devices, end-user workstations and devices, use cybersecurity tools, analyze security events, and implement security measures.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Norma Colunga-Hernandez
(956) 364-4774
ncolunga-herna@tstc.edu

www.tstc.edu

TSTC Cybersecurity Student

THE CITADEL

The Citadel: Achieving Excellence in the Education and Development of Principled Leaders

The Citadel, The Military College of South Carolina, is a landmark in Charleston and South Carolina that is noted for its educational reputation as well as its rich history. Founded in 1842, The Citadel has an undergraduate student body of about 2,300 students who make up the South Carolina Corps of Cadets. Another 1,000 students attend The Citadel Graduate College, a civilian evening and online program that offers graduate and professional degrees and undergraduate programs.

The Citadel has been designated as a National Center of Academic Excellence in Cyber Defense Education since 2016 for its Bachelor of Science in Computer Science with a minor in cybersecurity.

The Citadel established the Center for Cyber, Intelligence, and Security Studies to promote education, research, and outreach in cybersecurity,

intelligence, and national security. The Citadel also offers an undergraduate minor in cyber interdisciplinary studies and a graduate certificate in cybersecurity, jointly with the College of Charleston. In fall 2020, The Citadel will offer a Bachelor of Science in Cyber Operations.

In the outreach realm, the Citadel hosted GenCyber Camps for middle and high school teachers in 2016, for middle and high school students in 2018, and for middle and high school girls in 2019. Students also formed a cybersecurity club and The Citadel Cyber Defense Team participates in different cyber defense contests.

The Citadel was awarded DoD Cybersecurity Scholarship for five students and a National Science Foundation CyberCorps®: Scholarship for Service for Citadel CyberCorps® Scholarship for Service: Principled Leaders with Multi-Disciplinary Cybersecurity Expertise.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Dr. Shankar M. Banik
(843) 953-5039
shankar.banik@citadel.edu

citadel.edu/root/cciss
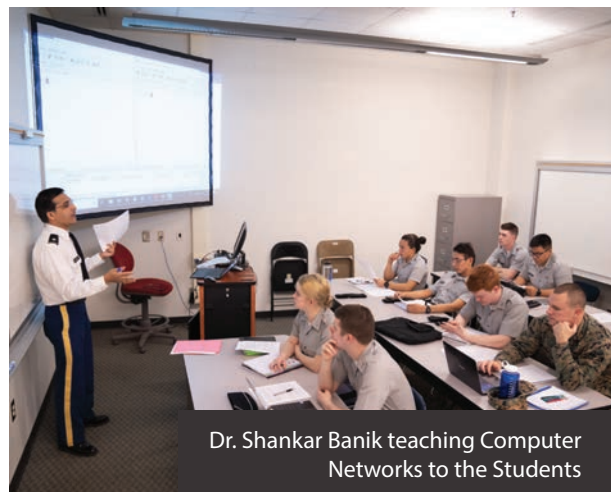
Dr. Shankar Banik teaching Computer Networks to the Students

THOMAS NELSON COMMUNITY COLLEGE

Thomas Nelson Community College Campus

Thomas Nelson Community College is an accredited, two-year institution of higher education established as a part of a statewide system of community colleges. We primarily serve the residents of the cities of Hampton, Newport News, Poquoson, and Williamsburg, and the counties of James City and York.

Since 2002, Thomas Nelson has proudly provided cybersecurity training to the Virginia Peninsula. From certificate attainment to degree alignment, we provide career pathways for the Peninsula's cybersecurity professionals. Thomas Nelson strives to enable students to graduate with high-demand skills and content knowledge and establish additional cyber business-education partnerships. In order to accomplish this, we host cybersecurity conferences addressing cyber threats, malware, forensics, mitigation, industrial control systems, new technologies, governance, regulations, and

compliance and business/higher education issues, as well as maintain strategic partnerships with Cyber Watch, InfraGard, Armed Forces Communications Electronics Association, International Information Systems Security Certifications Consortium, Information Systems Security Association, and the HR Cyber Alliance.

Thomas Nelson's Cybersecurity program consists of two components: a career studies certificate for those who already have a degree and are seeking specialization, and an Associate of Applied Science (AAS) program for incoming freshmen seeking a career in cybersecurity, and industry certifications for those currently in the industry. Our AAS in IST degree with the cybersecurity focus is transferable to many four-year institutions and offers students the opportunity to participate in cybersecurity competitions and conferences.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

(757) 825-2937
wtce@tncc.edu

tncc.edu/cybersecurity

TNCC Cybersecurity Course

TIDEWATER COMMUNITY COLLEGE
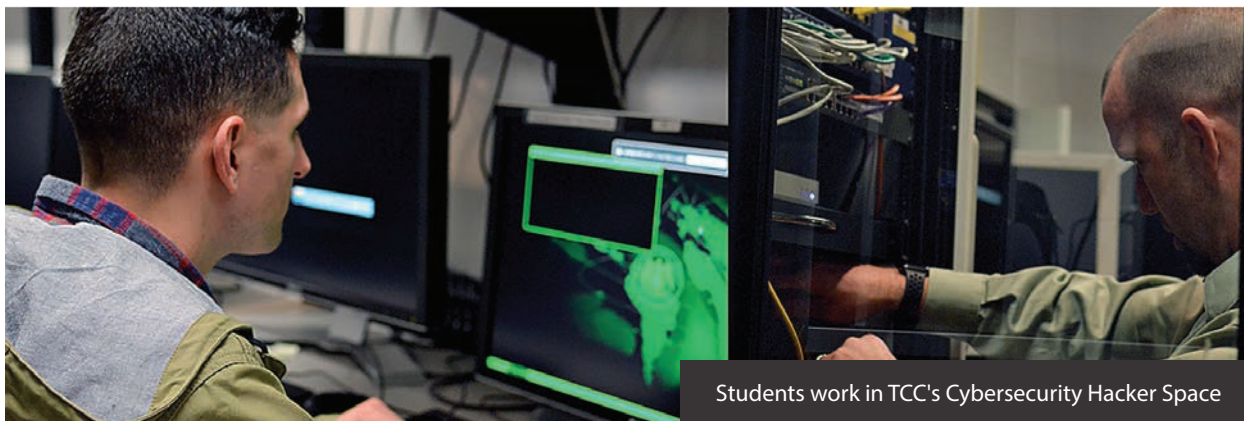
Students work in TCC's Cybersecurity Hacker Space

Tidewater Community College of Virginia has been designated a National Center of Academic Excellence in Cyber Defense Two-Year Education (CAE-2Y) by the National Security Agency and the Department of Homeland Security.

TCC's Cybersecurity program is designed to promote higher education in Cyber Defense (CD) and prepare a growing number of cybersecurity professionals to meet the national demand for cyber defense education and to protect the national information infrastructure to reduce vulnerabilities in the Nation's networks. Since its inception, TCC's network security/cybersecurity curriculum has been aligned with national standards for cybersecurity established and maintained by National Institute for Standards and Technology (NIST) and the NSA.

Our A.A.S degree is transferable and offers students the opportunity to participate in competitions and extracurricular activities that sharpen skills and knowledge and provide networking opportunities.

TCC hosts a Hacker Space which is a full penetration testing lab designed to facilitate learning about the practical side of vulnerability assessments and penetration testing in a safe environment. The lab utilizes a virtualized platform to provide vulnerable and mis-configured hosts, domain controllers, web servers, mail servers, firewalls, web applications, and many more systems, services, and applications. Students are able to practice their offensive and defensive cybersecurity skills in a safe, isolated, sandbox environment that encourages freedom to experiment.

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

Bill Clement
(757) 822-7124
wclement@tcc.edu

tcc.edu/cybersecurity
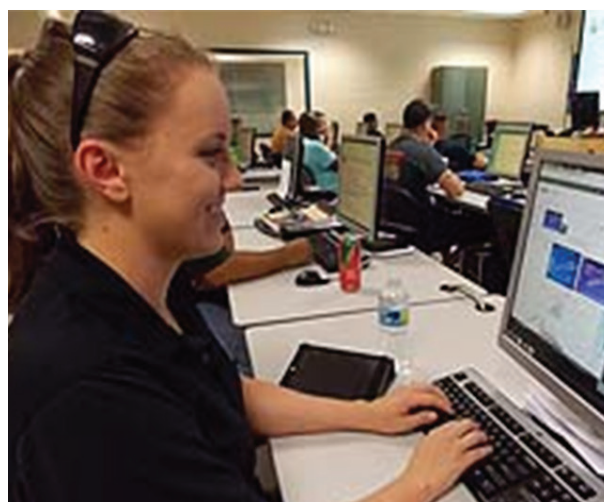
Student Beth Quesada participates in a face-to-face class lecture

TU TOWSON UNIVERSITY

Stephens Hall at Towson University

The **Department of Computer and Information Sciences at Towson University** started one of the first undergraduate cybersecurity programs in the nation and the first in Maryland.

The National Security Agency and Department of Homeland Security designated Towson University as a National Center of Academic Excellence in Cyber Defense Education in 2002 and in Cyber Operations in 2013. TU is one of the few institutions in the nation to receive the NSA/DHS Cyber Operations designation. The Accreditation Board for Engineering and Technology (ABET) has accredited Towson University's cyber operations track in the computer science B.S. degree program until 2024. This makes our program one of the first four ABET accredited cybersecurity programs.

The department has received cybersecurity grants from the National Science Foundation, Department of Defense, Army Research Lab, and several other federal and state agencies. From our award-winning Cyber Defense team to our CyberCorps® scholarships for cybersecurity students and our cybersecurity programs available at the undergraduate and graduate levels, Towson University allows you to receive the education you need to succeed in the field.

All students in the department are in an environment that provides extra-curricular opportunities in cybersecurity. We have monthly cybersecurity seminars with invited speakers from industry and government, an active Cyber Defense Club, and a Cyber Defense Team that has been ranked first in mid-atlantic Collegiate Cyber Defense Competitions and ranked at the national CCDC. Faculty at Towson are working on cutting-edge federally funded cybersecurity research on the smart grid, wireless networks, cyber-physical systems, and social networks.

DESIGNATIONS

• CAE – Cyber Defense Education
• CAE – Cyber Operations

CONTACT INFORMATION

Sidd Kaza, Ph.D.
(410) 704-2633
skaza@towson.edu

www.towson.edu/cyber

Students competing in a practice cyber defense competition.

TRIDENT TECHNICAL COLLEGE

TTC Campus

Located in South Carolina, **Trident Technical College (TTC)** offers associate degrees, diplomas, and certificates covering 10 areas of interest that cover a wide variety of career fields and academic pursuits. It was the first two-year college in South Carolina to be designated as a National Center of Academic Excellence in Cyber Defense Education by the National Security Agency and the Department of Homeland Security.

Students at TTC have access to the latest hardware and software necessary to provide comprehensive hands-on training. This experience enables individuals to gain the required knowledge and skills to be successful in cybersecurity related fields. Training includes, but is not limited to, the following technical areas of study: networking, Windows and Linux server administration, digital and network forensics, and ethical hacking.

The Associate of Applied Science (A.A.S.) in cybersecurity is a career degree because it provides the skills required to enter the workforce. The program allows students to implement real-world tools and scenarios to prepare for a career in cybersecurity, and the many facets of cyberspace.

TTC has developed articulation agreements allowing students to transfer to select colleges. Backing up TTC's reputation and ability to offer a robust program are multiple grants awarded over the past years. The latest, Cyber SECURE, was awarded by the Office of Naval Research and the National Science Foundation CLOUDTech grant with the goal of strengthening the talent pipeline and the demand for cybersecurity professionals. TTC is a Cisco Networking Academy, Red Hat Academy, CompTIA Authorized Academy, and a Microsoft and VMware IT Academy.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Terry Richburg
(843) 574-6608
Terry.Richburg@TridentTech.edu

bit.ly/TTCCyberCenter

TTC Cybersecurity Students

TUSKEGEE UNIVERSITY

Tuskegee University Campus

Tuskegee University is a private, historically black university (HBCU) located in Tuskegee, Alabama. Over the past 138 years since it was founded by Booker T. Washington in 1881, Tuskegee University has become one of our nation's most outstanding institutions of higher learning. The Brimmer College of Business and Information Science is deeply rooted in Tuskegee University's historical mission.

The Center of Information Assurance Education (CIAE) at Tuskegee University (TU) is housed within the Computer Science Department at the College of Business and Information Science. The CIAE at TU was initially designated as a National Center of Academic Excellence in Information Assurance Education (CAE-IAE) by NSA/DHS in 2012, and was re-designated as National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) by DHS/NSA in 2017.

CIAE at TU serves as organizing body to offer resources and assistance for faculty, students, and community in conducting teaching, research, and other activities in information assurance. The major accomplishments include the computer science department launch of an inter-disciplinary master program in Information Systems and Security Management (MS-ISSM), which is designed to fill current and future needs for information assurance and cyber defense professionals. With the efforts of the CIAE, the university was awarded the CyberCorps®: Scholarship for Service (SFS) funded by the NSF to strengthen the national cybersecurity workforce for a period of five years beginning in 2017.

Tuskegee University is very committed to Information Assurance/Cyber Defense program of education, research, and outreach because of the crucial nature of cybersecurity for the nation.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Fan Wu
(334) 727-8362
fwu@tuskegee.edu

tuskegee.edu/about-us/centers-of-excellence

CAE designation acceptance

UNIVERSITY OF ADVANCING TECHNOLOGY

University of Advancing Technology - Tempe, Arizona

Bachelor of Science in Network Security
A US Government Recognized Cyber Security Degree for Ethical Hackers

UAT's Network Security Bachelor of Science is a cybersecurity degree that prepares students to take on the ever-evolving world of online theft and corruption. Our cybersecurity degree combines essential and best of class elements of software and network programming and network security analysis. This degree is designed around the contemporary skills and advanced tools associated with security for information network technology initiatives.

Designated as a National Center of Academic Excellence in Cyber Defense by the NSA and DHS National IA Education and Training Program (NIETP), UAT offers an ethical hacking degree that's highly recognized by industry and government entities alike.

The Highest Standard of Ethical Hacking

The focus of this cybersecurity degree is creating ethical hackers and network security professionals who will have mastery in ethical hacking, upholding to the highest industry standard of integrity over the quickly evolving world of technology and online security. Network security initiatives are becoming increasingly vital to the well-being of the general population and all business and government organizations. Graduates with UAT's network security degree will be prepared for careers with government entities and multinational corporations seeking certified ethical hacking professionals. With the completion of this NSA designated network security degree, you will gain the ability to protect and defend commerce and culture against the online world of theft and corruption.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Greg Miles
(602) 383-8228
gmiles@uat.edu

www.uat.edu/network-security-degree

UAT Cyber Warfare Range

UNITED STATES AIR FORCE ACADEMY

USAFA Graduation

The **United States Air Force Academy** isn't just a premier higher-education establishment. It's an unparalleled academic and military institute that provides cadets with rewarding opportunities to transform into the leaders of tomorrow. Our mission is to educate, train, and inspire men and women to become leaders of character, motivated to lead the United States Air Force in service to our nation. From day one, cadets undertake a rigorous but rewarding program of academic, military, athletic, and character development. The academic experience balances science, technology, engineering, and mathematics (STEM) with arts and humanities. Our robust core curriculum places cadets at the intersection of these disciplines, generating opportunities to cultivate and apply creative and complex problem-solving abilities and offering opportunities to complete cutting-edge research. It's life at a different altitude.

The Department of Computer and Cyber Sciences offers two ABET-accredited undergraduate majors – computer science and cyber science. Computer science emphasizes computing theory and software engineering; cyber science focuses on networks, computer forensics and cyber operations. Integrated throughout the curriculum is CyberCity, a 1:87 scale city with SCADA-controlled residential, industrial, and military infrastructure, allowing cadets to experience the kinetic impacts of cyber operations. The USAFA cyber science major was the first in the world to achieve ABET accreditation. Supporting the academic program is the Academy Center for Cyberspace Research, which conducts customer focused research and development in conjunction with industry partners in systems security, artificial intelligence and autonomous systems, immersive environments, and process automation.

DESIGNATIONS

- **CAE - Cyber Defense Education**
- **CAE - Cyber Operations**

CONTACT INFORMATION

HQ USAFA/DFCS
(719) 333-3590
DFCS.exec@usafa.edu

usafa.edu/department/computer-science

Cyber City

University at Buffalo
The State University of New York

UB Institution - School of Engineering Building, Davis Hall

The mission of the **Center of Excellence in Cybersecurity at University at Buffalo (UB)** is graduate education and coordinated research in computer security and information assurance (IA) by faculty members from several schools and departments at the university. This center has been conducting research in the area of intrusion detection, cyber situation awareness, insider threat assessment and mitigation, continuous authentication using behavioral biometrics, and language-oriented security.

Since the establishment of the Center of Excellence, UB has received over $10 million in research and education grants from agencies such as NSF, NSA, DARPA, and AFRL and companies such as Intel Corporation and Harris Communication. The center has been running the NSF CyberCorps®: Scholarship for Service program since 2008 and produced more than 40 cybersecurity experts. Through the DoD's Cyber Scholarship Program (CySP), it produced nine scholars between 2004 and 2008.

The center has been running middle school and high school camps under the GenCyber program pioneered by NSA since 2015 and has been running the International Program in Information Assurance and Management (IPIAM) for banking executives since 2012. It has conducted more than 100 cybersecurity awareness workshops in the western New York region with over 3,500 middle school and high school student participants. The center offers an advanced graduate certificate in IA with both technical and managerial tracks and over 40 students received the certificate since its inception. The center routinely conducts cybersecurity competitions, instilling interest among participating students.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Shambhu Upadhyaya
(716) 645-3183
shambhu@buffalo.edu

cse.buffalo.edu/caeiae

UB's GenCyber Camp educates middle and high school students about cybersecurity principles and career opportunities

UNIVERSITY OF ADVANCING TECHNOLOGY
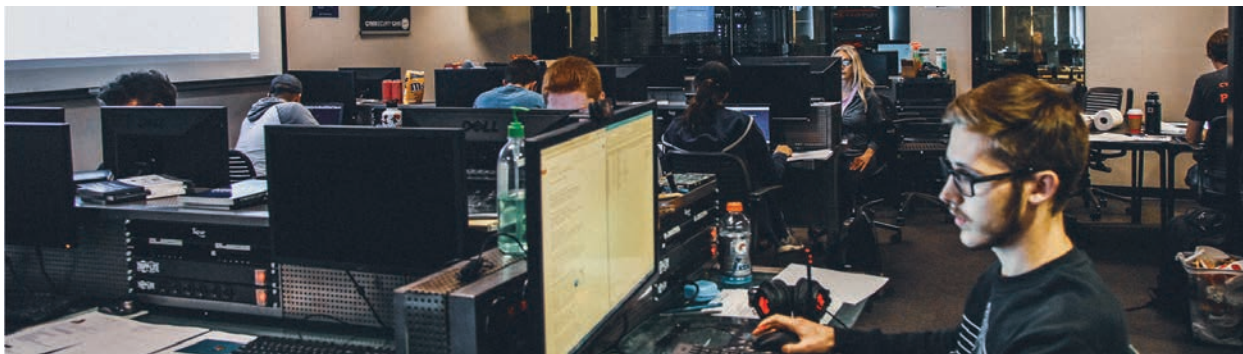
UAT Cyber Security students compete in the Western Regional Collegiate Cyber Defense Competition

The **University of Advancing Technology (UAT) is an** intimate, private technology university focused on educating students in advancing technology who desire to innovate for our future. Our technology infused, urban campus in Tempe, AZ, is a technology nexus; a collection of technophiles, tech geeks, and mavens of the digital world that evolve into top technology executives, master programmers, cyber warriors, forensic sleuths, robotic engineers, interactive filmmakers, and game innovators for entertainment and government animation applications.

UAT is among a select few 100 percent STEM-based universities in the nation. Our unrivaled computer science degree programs are a benchmark of success within academia. UAT is an ideal environment for technology degree students who value uniqueness and the power of advancing technology as well as the rigors of a traditional education.

In the realm of cybersecurity, our degree programs and cyber warfare range are recognized by industry and government entities alike for their ability to help generate the future innovators of the cybersecurity industry. We focus on creating true leaders who will have mastery in ethical hacking and uphold the highest industry standard of integrity in our quickly evolving world of cybersecurity tech and online security.

UAT is marking 20 successful years since the inception of its elite network security degree program. As one of the longest-running cybersecurity degrees in the southwest, our complete continuum of undergraduate and graduate cybersecurity degrees have helped prepare more graduates with the NSA and CAE designated education than any other university's cybersecurity program in the southwest.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Dave Bolman
(602) 383-8228
dbolman@uat.edu

uat.edu/cyber

UAT Cyber Security students compete in the Western Regional Collegiate Cyber Defense Competition

UNIVERSITY OF ALABAMA

UA Campus

Founded in 1831 as the state's first public college, **The University of Alabama (UA)** is dedicated to excellence in teaching, research, and service. Known as the Capstone of Higher Education, UA students are provided the opportunity to learn from exceptional faculty members and to enhance their education through both classroom and research lab experiences. The University of Alabama has been recognized as a National Center of Academic Excellence in Cyber Defense Research since 2014.

At UA, cyber is identified as one of the four main thrusts of the university. To that end, UA offers numerous degrees, minors, and concentrations to provide students with a well-rounded knowledge and skill-set in cyber-related fields. Students have the opportunity to obtain technical knowledge from the Computer Science program, behavioral knowledge from the Criminology and Criminal Justice program, and organizational knowledge from the Management Information Systems program. This is a unique set of knowledge skills of the complementary aspects of cybersecurity.

The most recent addition is a Bachelor of Science in Cybersecurity offered by the Department of Computer Science that will begin Fall 2020. This program is designed to provide a rigorous technical degree that imparts the necessary knowledge, skills, and motivations to protect and defend digital information from attacks.

In addition, the university provides opportunities in cyber-related fields on many levels including CyberCorps®: Scholarship for Service, graduate assistance in areas of national need, multiple student-led cybersecurity clubs, and K-12 outreach with our annual Capture the Flag competition.

DESIGNATIONS

• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Dr. Travis Atkison
(205) 348-4740
atkison@cs.ua.edu

ovpred.ua.edu/cyber-institute

UA's most recent addition is a Bachelor of Science in Cybersecurity

UNIVERSITY OF ALABAMA AT BIRMINGHAM

UAB Campus
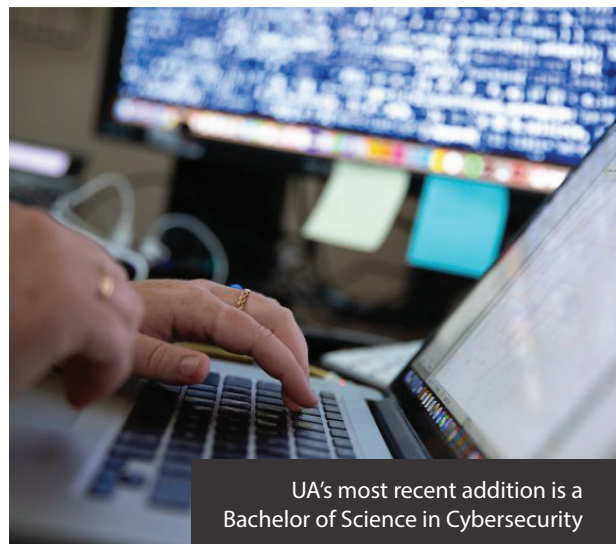
University of Alabama at Birmingham (UAB) takes a holistic approach to studying the nuts and bolts of cyber attacks and building transformative solutions that can prevent, detect, and recover from these attacks. Our research focuses on technologies, applications, and theoretical foundations of cybersecurity, with focus on network security, mobile device security, wireless security, applied cryptography, cryptocurrency, cloud security, user-centered security, quantum resistant cryptography, software security, digital forensics, and criminal investigations.

We make a multi-disciplinary perspective of solving security problems, exemplified by our ongoing collaboration between Computer Science, Criminal Justice, Psychology, School of Medicine and School of Health professions. Our faculty plays a leadership role in University-wide cybersecurity initiatives, and has a history of transitioning its research into practice through start-ups. Our research is well-integrated with UAB's other disciplines and with our many academic programs, including BS in Computer Science, BS in Digital Forensics, MS in Cyber Security, MS in Data Science and PhD in Computer Science. Our research has been funded by federal agencies and industry partners alike and has been widely recognized by international peers as well as industries. Because of this recognition, we have been invited to serve on the organizing and technical program committees of top tier conferences, advisory boards of industries, and government agencies. Some of our research outcomes have been incorporated into international standards for cybersecurity, while others are mentioned in widely used textbooks in cybersecurity.

We are a recipient of NSF CyberCorps® SFS grants to train highly skilled cybersecurity professionals for federal and state governments. Graduates from our academic programs, especially our Masters and PhD programs, have been contributing significantly to the cybersecurity of government agencies at all levels and private businesses including Visa, Microsoft, and Google.

DESIGNATIONS

• CAE – Cyber Defense Research

CONTACT INFORMATION

Yuliang Zheng, Ph.D.
(205) 934-8657
yzheng@uab.edu

thecenter@uab.edu

UNIVERSITY OF ALABAMA IN HUNTSVILLE

UAH Campus
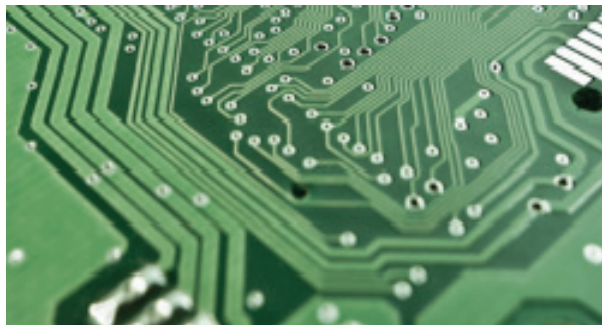
Since 2007, the **University of Alabama in Huntsville (UAH)** has been designated as a National Center for Academic Excellence (CAE), receiving the designation in the area of Information Assurance Education. Currently a CAE both in Cyber Defense and in Research, the university offers numerous cybersecurity-related degrees on the undergraduate and graduate levels in the fields of computer science (B.S., M.S., and PhD), computer engineering (B.S., M.S., and PhD), and information systems (B.S. and M.S.).

In 2019, UAH expanded its offerings to include the state's first Bachelor of Science in Cybersecurity. Students in this program learn to identify and mitigate computing system vulnerabilities and apply security principles and practices as well as the implementation of the physical, software, and human component of systems. This interdisciplinary approach provides students with a thorough understanding of modern computing systems from a hardware and software perspective.

The Center for Cybersecurity Research and Education (CCRE) at UAH leverages its partnerships with government entities and local industry to provide students with hands on experience through sponsored research. Projects include SCADA security, physical and digital navigational lock cyberthreat modeling, and risk/supply chain assessments. The center supports the National Science Foundation's Scholarship for Service and DoD CySP. Additionally, the center advances cybersecurity education through curriculum development projects, GenCyber camps, and its Cyber Force Incubator.

DESIGNATIONS

• **CAE – Cyber Defense Education**
• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Dr. Tommy Morris
(256) 824-4782
tommy.morris@uah.edu

uah.edu/ccre

UAH Cyber Students

![UA Eller College of Management, McClelland Hall]
UA Eller College of Management, McClelland Hall

The **Information Assurance and Security Education Center (IASEC)** in the **Eller College of Management** at the **University of Arizona** promotes cybersecurity through education, training, and research. Designated as a National Center of Academic Excellence in Cyber Defense Education and Research, IASEC offers faculty, students, and the community resources to study and address the cyber vulnerabilities of our nation's information infrastructure. The IASEC team works collaboratively to promote responsible information and cybersecurity practice through curriculum development, industry partnerships, cutting-edge research, and outreach.

One component of IASEC is the Master's in Cybersecurity program. Graduates of the Master's in Cybersecurity program will understand how to prevent, monitor, and respond to data breaches and cyberattacks. The University of Arizona's online MS in Cybersecurity enables you to bolster your technical and analytical skills, all from the convenience of your home or office.

The program is designed for IT, engineering, and other professionals who have three years of work experience and want to boost their skills for a cybersecurity career path. Designed specifically for those with technical experience, the degree focuses on effectively applying analytical and critical thinking to plan and execute security measures to shield an organization's computer systems, networks, and networked devices from infiltration and cyberattacks.

Students engage in theoretical and hands-on approaches to learning the critical components of cybersecurity. Cybersecurity courses cover topics such as business analytics, cyber threat intelligence, information security, risk management, systems security management, penetration testing, network security, and system cybersecurity engineering.

DESIGNATIONS

- **CAE – Cyber Defense Education**
- **CAE – Cyber Defense Research**

CONTACT INFORMATION

Lance Hoopes
(520) 621-2385
iasec@eller.arizona.edu

eller.arizona.edu

![Dr. Hsinchun Chen, Chair, Management and Technology]
Dr. Hsinchun Chen, Chair, Management and Technology

The University of Arkansas Campus

The University of Arkansas was designated as a National Centers of Academic Excellence in Information Assurance Research in 2012 and again in 2014 when the designation was modified to National Centers of Academic Excellence in Cyber Defense Research. The mission of the center is to promote education and research in the field of computer security and information assurance at the University of Arkansas.

The activities of this center include, but are not limited to, fostering multidisciplinary research, securing large-scale funding from federal, state, and other funding agencies, providing education and training to the future workforce, and increasing awareness in the field of information security and reliability by offering appropriate seminars and workshops.

The following faculty members are part of the center:

- **Brajendra Panda**, Center Director (cybersecurity/database security)
- **David Andrews** (architecture security)
- **Paul Cronan** (ethical behavior/academic integrity)
- **Jia Di** (asynchronous integrated circuit design and hardware security)
- **Miaoqing Huang** (cloud security)
- **Qinghua LI** (cybersecurity and privacy)
- **Dale Thompson** (wireless systems security and network security)
- **Xintao Wu** (cybersecurity and privacy)

DESIGNATIONS

- **CAE - Cyber Defense Research**

CONTACT INFORMATION

Brajendra Panda
(479) 575-2067
bpanda@uark.edu

isr.csce.uark.edu

Student Technology Center

Kemper Hall at UC Davis

Professor Karl Levitt founded the **University of California Davis (UC Davis) Computer Security Laboratory ("Seclab")** in 1986. The members of the "Seclab" have pioneered many areas of computer security including:

 • First network Intrusion Detection Systems (NSM)
 • First distributed Intrusion Detection Systems (DIDS)
 • Modeling large scale attacks for IDS (GrIDS)
 • First modeling of scenario attacks (Requires/Provides)
 • Property-based testing and property-based models of vulnerability analysis

The research conducted by the members of Seclab crosses not only computer science boundaries, but also disciplinary boundaries, including work with political science, government policy, and law. Members of Seclab have entered industry, academia, and government, and made many contributions to those sectors. Research projects span the entire field, including the use of argumentation in system security analysis, social network and "fake news" security to analyzing e-voting systems and the process of how an election is run.

We teach many computer security-related courses (for graduate students, undergraduate CS students, and non-CS majors), and are doing research in computer security and information assurance education. One such grant is looking at a way to teach secure programming (funded by the National Science Foundation). One of our faculty members co-led an Association for Computing Machinery/The Institute of Electrical and Electronics Engineers Joint Task Force on Cybersecurity Curricular guidelines, resulting in the release of the "Cybersecurity Curricula 2017: Curriculum Guidelines for Post-Secondary Degree Programs in Cybersecurity".

Finally, Professor Matt Bishop published the second edition of his widely-used textbook "Computer Security: Art and Science". It was one of the first textbooks to provide rigor for the field of cybersecurity.

DESIGNATIONS

 • **CAE – Cyber Defense Education**
 • **CAE – Cyber Defense Research**

CONTACT INFORMATION

Matt Bishop
(530) 752-8060
mabishop@ucdavis.edu

seclab.cs.ucdavis.edu

UC Davis Cyber Students

UCI

UNIVERSITY OF CALIFORNIA, IRVINE

Donald Bren Hall at UCI

UC Irvine's Donald Bren School of Information and Computer Sciences (ICS) is proud to celebrate 10 years as an NSA/DHS National Center of Academic Excellence in Cyber Defense Research. As one of the few computing-focused schools in the nation—and the only in the UC system after 50 years—ICS is uniquely positioned to advance cybersecurity research. UCI is centrally located in Irvine, known as the "City of Innovation," which has quickly become one of Southern California's fast-growing tech and security hubs—home to numerous tech Fortune 1,000 companies, fast-growing startups, and a collaborative community of highly innovative people.

ICS has long been at the forefront of cybersecurity in education, housing over a dozen internationally renowned professors, including senior faculty members Michael Franz, Ian Harris, Scott Jordan, Sam Malek, Sharad Mehrotra, and Gene Tsudik, as well as new ICS faculty members Alfred Chan and Josh Garcia, whose research examines both technical and nontechnical dimensions of cybersecurity.

Over the last decade, ICS has also graduated over 30 Ph.D. students, and many more master's students, with a cybersecurity focus who have gone on to work in academia and industry at organizations such as IBM, Xerox PARC and SPAWAR. In 2016, UCI deepened its commitment to cybersecurity research by opening the Cybersecurity Policy and Research Institute (CPRI), with the goal of finding multidisciplinary legal, policy and technological solutions to combat cyber threats while protecting and enhancing individual privacy and civil liberties. CPRI is led by Executive Director Bryan Cunningham, an international expert on cybersecurity law and policy who formerly served as a White House lawyer and CIA officer and helped draft the first National Strategy to Secure Cyberspace.

DESIGNATIONS

• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Gene Tsudik
(949) 824-3410
gts@ics.uci.edu

cpri.uci.edu

Students competing at HackUCI

UNIVERSITY OF CINCINNATI

Cybersecurity Summer Camp

Cyber@UC in a CTF Competition

CAE-CD - The School of IT started a cybersecurity undergraduate track in 2014. The track courses were used to map to the CAE Knowledge Units and the **University of Cincinnati** was designated as a CAE-CD in 2016. The designation tremendously helped the growth of cybersecurity program. In four short years, we received a series of education and research grants, leading to an explosive growth of student enrollment in cyber programs.

NSA-CNAP Grant - Provided a 12-week training camp for 100 veterans, firefighters, and government workers.

NSA-CNAP Grant - Trained and prepared instructors and high school teachers to teach cybersecurity curricula.

GenCyber Grant – Summer camps to expose high school students/teachers to cybersecurity concepts.

DESIGNATIONS

- **CAE - Cyber Defense Education**
- **CAE - Cyber Operations**

CONTACT INFORMATION

CAE-CD: Dr. Chengcheng Li
Chengcheng.li@uc.edu

CAE-CO: Dr. John Franco
franco@uc.edu

Cyber Range Grant – A $1.9m grant awarded to UC to provide cybersecurity education and exposure events to K-12, higher education, and professionals.

Early College Program – An education program between the School of IT and dozens of high school districts in Ohio to teach the complete first year college IT courses in high school.

In addition to the undergraduate cybersecurity track, a cybersecurity focused graduate program and a cybersecurity certificate program offered by School of IT and School of Criminal Justice experienced a rapid growth.

CAE-CO - In 2014 the NSA designated UC as a Center of Academic Excellence in Cyber Operations. The center has four aims:

1) Outreach, especially to high schools.

2) Contribute to improving the quality and quantity of America's cyber workforce, especially in cyber operations.

3) Encourage student participation and motivation in cyber education and research.

4) Pursue advance research in topics related to cyber operations such as malware detection.

The excitement of designation has spawned a very active student group called Cyber@UC, whose main mission is education in cyber and outreach, and has made possible the creation of a cyber laboratory which Cyber@UC is building and will maintain.

UNIVERSITY OF CONNECTICUT

Innovation Partnership Building at UConn

The **Connecticut Cybersecurity Center (C3) at the University of Connecticut** has been designated as an NSA/DHS National Center of Academic Excellence in Cyber Defense Research since 2010. C3 is an applied research center that investigates, develops, promotes, and nurtures the best hardware and software-based security practices for indispensable defense and commercial (e.g., insurance, telecommunications) application domains. C3 is comprised of four niche cybersecurity centers: Center for Voting Technology Research (VoTeR), Center for Hardware and Embedded Systems Security and Trust (CHEST), Comcast Center for Security Innovation (CSI), and Synchrony Financial Center of Excellence in Cybersecurity.

The VoTeR Center is chartered to advise the State of Connecticut in the use of electronic election technologies, to investigate voting solutions and voting equipment, and to develop and recommend safe use procedures for electronic systems used in the electoral process. CHEST, as a center, is focused on vulnerabilities and threats revolving around hardware abstractions, such as hardware counterfeits, Trojan detection, backdoors, hardware tampering, hardware vulnerability analysis, side-channel attacks (and resilience), and hardware quality and reliability.

The CSI and Synchrony centers, while spanning the breadth of hardware, software, and network cybersecurity research, is narrowly focused on the research challenges of Comcast Corp. and Synchrony Financial respectively. In addition to these centers, C3 also entertains cybersecurity issues materializing in encompassing domains such as mobile computing, medical systems, or web-based services and applications. C3 is home to 12 faculty, over 50 graduate and undergraduate students, and over $4M in active research grants from industry and federal funding agencies.

DESIGNATIONS

• **CAE – Cyber Defense Research**

CONTACT INFORMATION

John A. Chandy
(860) 486-5047
john.chandy@uconn.edu

c3.engr.uconn.edu

Students working in the CSI Lab

UNIVERSITY OF DALLAS
Satish & Yasmin Gupta College of Business

The University of Dallas Campus

In 2003, the **University of Dallas** cybersecurity program was designated as a National Center of Academic Excellence in Cyber Defense Education. This STEM-designated program is accredited by the Association to Advance Collegiate Schools of Business and nationally ranked by Best Colleges, Online Masters, and Online MBA Today.

The program provides students with an in-depth understanding of the complexities in protecting and defending infrastructures and networks that contain valuable information. Courses are offered online, in the classroom, or through a combination of online and on-campus classes. UD offers an MBA and an MS in Cybersecurity, an MS in Cyber Intelligence and cybersecurity certificates. For the working professional taking two classes per semester, the cybersecurity program can be completed in 1.5 to 3 years.

The cybersecurity course content is created with cyber experts and data from the NSA, NIST, UD's Cyber Advisory Council, and highly qualified academic and professional cybersecurity professors. UD graduates are sought after by cybersecurity professionals and often pursue careers in areas such as threat analysis, cyber defense, network security, penetration testing, and digital forensics. UD is an active supporter of Women in Cybersecurity (WiCyS), and offers the George S. Sturgeon Cybersecurity Scholarship for Women.

In 2020, the University of Dallas will host the first Quantum Computing and Engineering Conference as well as other cybersecurity presentations and conferences. The cybersecurity program is the largest MS major at the University of Dallas. The NSA/DHS designation attracts quality students and contributes to the success of this program.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Sandra J. Blanke
(972) 721-5004
sblanke@udallas.edu

udallas.edu/cybersecurity

UNIVERSITY OF DELAWARE

Cyber Range in the Evans Hall iSuite
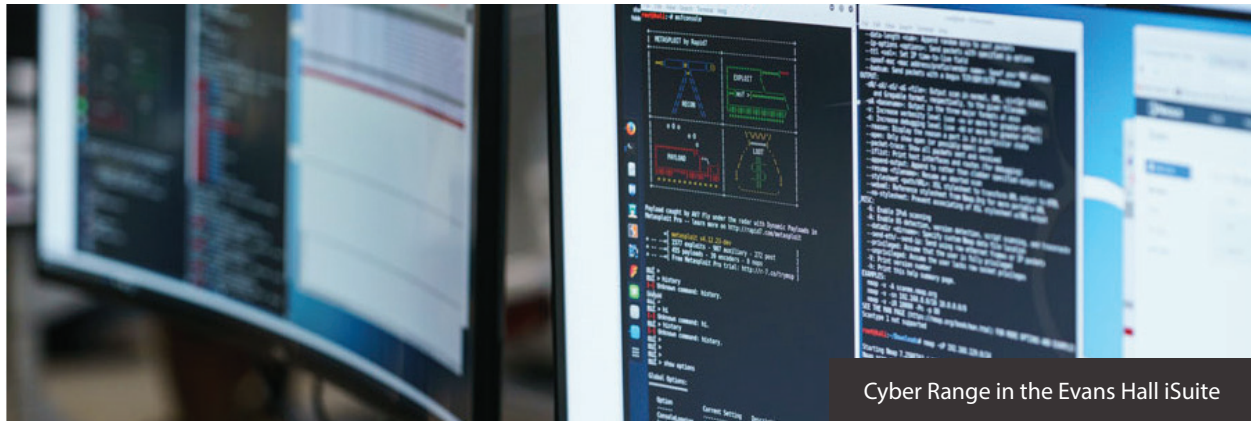
After seeking inputs from the U.S. Department of Defense, the U.S. government, the financial services industry, and other Fortune 500 corporations, the **University of Delaware** designed and created a unique and modern program for cybersecurity education.

Partnering with industry training leader SANS in the creation of a weeklong summer cyber boot camp for undergraduate, graduate, and later elite high school students, held yearly since 2010, reinforced the critical need to incorporate industrial strength, hands-on experiences into all phases of cybersecurity education.

With funding provided by the NSF, UD created a suite of third-generation cybersecurity educational programs which stress use of these student hands-on experiences to create lasting reinforcement of the expanding body of knowledge of computer and network security now known as cybersecurity.

Foundation cybersecurity courses were created covering subjects such as system protection and hardening, web applications security, pen testing, applied crypto, secure software design, reverse engineering, forensics, and secure embedded systems. The resulting degree programs include certificate programs, a cybersecurity minor for all BS/BA students, both on-campus and online Master of Science in Cybersecurity, a unique dual Cybersecurity/MIS Master's, and a broad portfolio of cyber research opportunities for PhD students spanning several departments such as ECE and CIS. Topics covered include lattice and post-quantum cryptography, machine learning in cybersecurity, secure software, blockchain, indicators of compromise, and hardware security.

Realizing that all engineers, scientists, and college graduates need to understand how cybersecurity will play a part in their careers and in every product or service that they help create, UD is now introducing cybersecurity across all disciplines and recently created a four-year, multidisciplinary undergraduate program for incoming high school seniors called Cyber Scholars.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Dr. Chase Cotton
(302) 831-8517
ccotton@udel.edu

csi.udel.edu

UNIVERSITY OF DETROIT MERCY

Pioneer in Cybersecurity Education

Founded in 2004, the **Center for Cyber, Security, and Intelligence Studies at University of Detroit Mercy** celebrates more than a decade of evolving excellence. The Center provides the education, experience, and resources essential to cultivate effective leaders in today's digitally dominated world. It combines University of Detroit Mercy's strength in software management, criminal justice, cyber defense operations, and risk management, and builds cybersecurity professionals who are guided by logic, critical thinking, and ethics.

The Center's cybersecurity lab provides students with hands-on learning tools used in cyber defense and forensics and graduates have gone on to work for federal security agencies, Fortune 500 companies, and nonprofit organizations.

Detroit Mercy is uniquely distinctive among CAEs by virtue of its well-documented history of excellence in software engineering education. Based on its publication and service record, Detroit Mercy is preeminent in a critical area of national academic interest — the study of secure software development and acquisition and ICT supply chain assurance. Detroit Mercy helped the Institute for Defense Analysis (IDA) develop the initial educational content and a pedagogy for ICT supply chain risk management in 2012. This particular expertise creates a unique program that produces not only conventionally skilled graduates, but also specialists in ICT acquisition.

Detroit Mercy offers a BS in Computer & Information Systems (CIS) with a major in cybersecurity, a BS in Criminal Justice, an MS in Information Assurance (MSIA), an MA in Criminal Justice, and an MS in Intelligence Analysis. Detroit Mercy also offers accelerated 5-Year BS to MS programs with combinations of these degree programs.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Anne Kohnke
kohnkean@udmercy.edu

liberalarts.udmercy.edu/academics/cis/center-for-cyber-intel-studies.php

UD Mercy Cyber Instructors
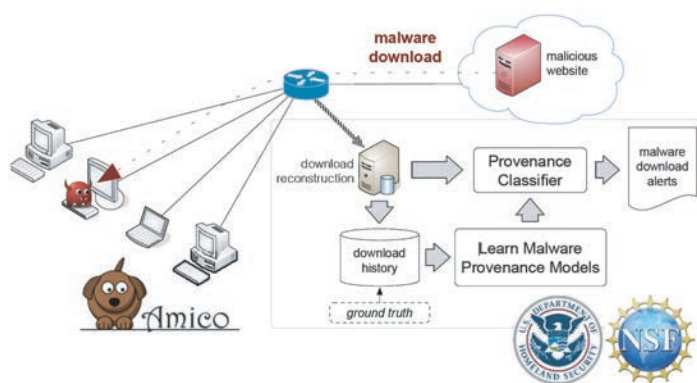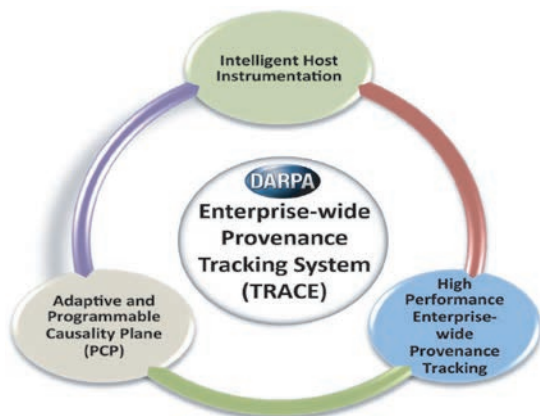
The mission of the **Institute for Cybersecurity and Privacy (ICSP) at the University of Georgia** is to contribute to meeting the nation's cybersecurity defense research and education needs. The goal of ICSP is to become a state hub for cybersecurity research and education, including multidisciplinary programs and research opportunities, outreach activities, and industry partnership.

Research by five faculty members in the ICSP is currently funded by the National Science Foundation, U.S. Air Force, Defense Advanced Research Projects Agency, Department of Homeland Security, Department of Defense and several industrial partners including Intel, Samsung, Cisco, PinDrop, and CodeGuard.

A team of ICSP faculty and students competed in the 2016 DARPA Cyber Grand Challenge (CGC) and entered the final event. The first CGC event opened a new frontier in cyber defense as intelligent systems, not humans, competed in an attack and defense CTF-style contest. The UGA team was selected to enter the final competition from a field of over 100 qualified teams from the whole world. The event was the latest in a series of Grand Challenges issues since 2004 by DARPA. Previous well-known challenges included driverless cars and physical robotics. Both events had tremendous impact on the technology development and industry.

DESIGNATIONS

• CAE - Cyber Defense Research

CONTACT INFORMATION

Dr. Kang Li
(706) 542-2911
cybersecurity@uga.edu

cybersecurity.uga.edu

UNIVERSITY OF HAWAI'I MANOA

The research of cybersecurity faculty at the **University of Hawai'i - Manoa (UHM)** covers many critical issues, including cryptography, cloud security, IoT security, information assurance, machine learning security, mobile/wireless security, network security, smart grid security, software/hardware security, supported by AFOSR, AFRL, EPSRC, NASA, NSA, NSF, NRL, ONR, ODNI, and industrial partners. UHM faculty have published 300+ papers in prestigious peer-reviewed journals and conferences, mentored security-focused graduate students, served as journal editors and reviewers, led research conferences, and given keynotes/invited talks at research conferences. These research successes earned UHM a CAE-R designation in May 2015. The designation provided many opportunities for Hawaiian communities including the establishment of the NSF CyberCorps® SFS program in 2016.

We have enhanced computer science BA/BS degrees with a Security Science Concentration and a management MS degree with Information Security. We have collaborated with local government, education institutions, and industry communities and founded CyberHawai'i in 2016, which broadens our outreach with high schools, community colleges, Hawai'i DOD, Hawai'i DOE, etc. We have hosted 18 NSF/NSA GenCyber Camps across 4 islands with 600+ campers since 2015. We have improved our curriculums with new security courses, including digital forensics, special topics in security (IoT, CPS, drone, wireless security, penetration testing, reverse engineering, etc.). We have worked with the UHM Airforce ROTC program and built the AFRL Cyber Spectrum Collaborative Research Environment program at UHM in 2017. We are currently improving cyber operation capabilities to build a CAE-OP in the next two years.

DESIGNATIONS

• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Yingfei Dong
(808) 956-3448
yingfei@hawaii.edu
sites.google.com/a/hawaii.edu/cae-r-at-university-of-hawaii/

GenCyber Camp

UNIVERSITY OF HAWAI'I MAUI COLLEGE

UHMC Campus

Situated on one of the most beautiful islands in the world, the **University of Hawai'i Maui College (UHMC)** is an accredited college that offers three bachelor of applied science degrees, a wide variety of associate degrees and certificates, as well as distance learning degrees through its UH Center on campus. It is the largest neighbor island college in the University of Hawai'i system, and serves the educational needs of residents of the three islands that comprise Maui County: Molokai, Lana'i, and Maui.

In 2012, UMHC established The Center for Cybersecurity Education and Research (CCER) to provide the local community and students with cybersecurity education, training and guidance. The mission of CCER is to provide cybersecurity guidance, training, and workforce development activities to the local community, K-12 students and teachers, as well as students enrolled at UHMC.

Recognizing the growing need of cybersecurity experts, UMHC has made cybersecurity an integral part of the Bachelor of Applied Science (BAS) degree within the Applied Business and Information Technology (ABIT) program. This program offers a unique hybrid degree that emphasizes business, entrepreneurship, and technology skills. With this degree in hand, many students continue on to graduate school, start their own businesses, or work in today's highest-paying industries. The BAS degree was designated in 2019 as a CAE-CDE.

UHMC inspires students to develop knowledge and skills in pursuit of academic, career, and personal goals in a supportive educational environment that emphasizes community engagement, lifelong learning, sustainable living, Native Hawaiian culture, and global understanding.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Debasis Bhattacharya
(808) 984-369
debasisb@hawaii.edu

maui.hawaii.edu/cybersecurity

ABIT students are trained to have essential cyber savvy skills that can be applied in a multitude of industries

UNIVERSITY OF HAWAI'I WEST O'AHU

UHWO Campus

Based on the rapid expansion of cyberspace operations and the importance of cybersecurity to both industry and the Asia-Pacific Region, the **University of Hawai'i - West O'ahu (UHWO)** developed the Bachelor of Applied Science degree with a concentration in Information Security and Assurance. This degree program is the first of its kind at a public institution in Hawai'i and the Pacific, developed in response to national and state needs for graduates with expertise in cybersecurity. The program is designated as a National Center of Academic Excellence in Cyber Defense Education (CAE-CD), certified by the National Security Agency (NSA) and the Department of Homeland Security (DHS). UHWO is the only four-year university in the state to earn this designation. Enrollment in this nationally recognized program has grown from 13 students in 2014 to 131 students in Fall 2018.

Cybersecurity students from the university have twice in the past three years won the National Cyber League competition as overall National Champions.

Though the support of the Office of Naval Research, UHWO established the UHWO Cyber Security Coordination Center (CSCC) in order to further promote Cyber Workforce Development. CSCC students research and analyze global and technical cyber events in order to coordinate with and support local and regional partners.

The Cybersecurity program is one of five signature programs at UHWO, which has been the fastest growing four-year baccalaureate public school in the nation during the past two years. The school based in Kapolei, Hawai'i was founded in 1976 and has an enrollment of 3,128 students.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Dr. Matthew A. Chapman
(808) 689-2333
mchapman@hawaii.edu

westoahu.hawaii.edu/cyber

Matthew Chapman, associate professor of information technology and cybersecurity

UNIVERSITY of HOUSTON
COLLEGE of TECHNOLOGY
Center for Information Security Research and Education

University of Houston Campus
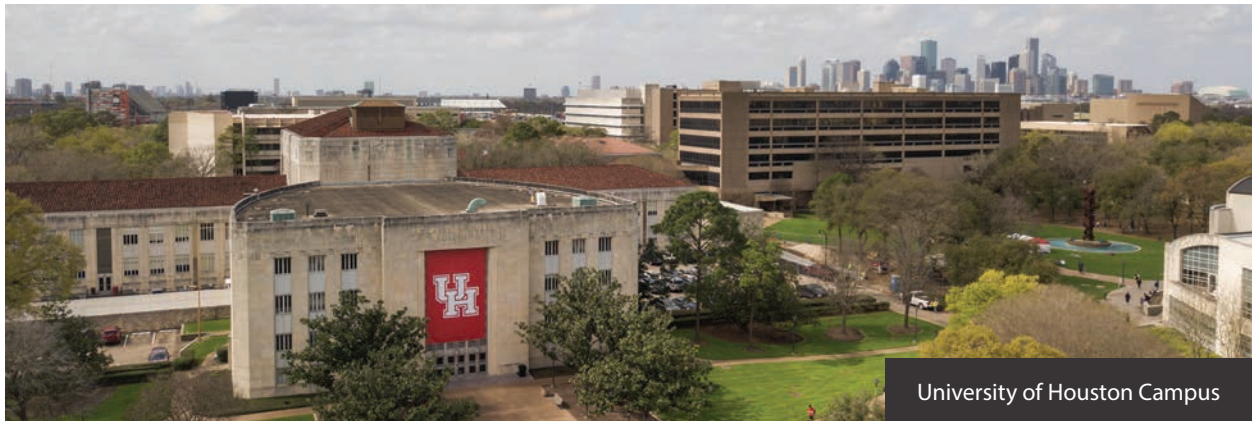
Established in 1927, the **University of Houston (UH)** empowers students in their pursuit of learning, discovery, leadership, and engagement. Ranked among the best colleges in America, UH is home to award-winning faculty, innovative research centers, has one of the most diverse student populations in the nation, and alumni who have become international leaders. At UH, we prepare students to envision their future, emerge as leaders, and launch careers that transform the world.

The University of Houston has developed a cybersecurity program under the aegis of the National Security Agency's Centers of Academic Excellence (CAE) Cyber Defense Education initiative and operated it since 2007. This program is situated within the Center for Information Security Research and Education in the College of Technology, an

institution that combines elements of engineering, computing, the sciences, business, and social sciences in applied, highly interdisciplinary programs. In 2015, the program expanded to include the Department of Computer Science resulting in the CAE Research designation.

Our programs prepare students for careers in cybersecurity via undergraduate, master's, and doctoral degrees. The recognized CAE CDE program is a professional master's degree in cybersecurity. This degree is designed to provide hands-on skills for working security professionals to lead cybersecurity teams. The program has specializations in critical infrastructure protections, digital forensics, and risk management. The Center for Information Security, Research, and Education at UH is the home of the CAE National Resource Center for Knowledge Unit development, an effort that leads the academic input that defines the academic requirements for CAEs.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Wm. Arthur Conklin
waconklin@uh.edu

uh.edu/tech/cisre

UNIVERSITY OF IDAHO

University of Idaho Campus

With a tradition of cybersecurity education and research since 1990, the **University of Idaho (UI)** was among the first seven universities to be designated a Center of Academic Excellence in 1999. In 2002, the UI was one of the first five Universities to participate in the NSF Scholarship for Service program.

UI faculty at our main campus in Moscow, Idaho and our branch campuses in Coeur d'Alene and Idaho Falls work with undergraduate and graduate student researchers to help educate and train the next generation of cybersecurity workforce while developing cutting edge new technologies to improve the security of the nation's computer systems. Through the Computer Science Department and our Center for Secure and Dependable Systems (CSDS), students can earn a BS, MS or PhD in Computer Science with an emphasis in cybersecurity.

Students in Electrical and Computer Engineering can also take cybersecurity courses and work jointly with CSDS researchers on interdisciplinary research projects. Our partnerships with Idaho National Lab and local industry allow students to work on real-world problems related to critical infrastructure, including the power grid and transportation systems.

As an example of our expertise, our world class faculty include Dr. Alves-Foss, who, working with Dr. Jia Song (who was then a Postdoctoral Research Associate and has now joined the UI Faculty) participated in the DARPA Cyber Grand Challenge in 2014-2016, qualifying the smallest team for the finals. Using CSDS expertise, they built new tools to successfully compete against well establish, larger research teams in this cutting-edge competition.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Dr. Jim Alves-Foss
(208) 885-5196
jimaf@uidaho.edu

uidaho.edu/engr/research/csds

Dr. Jim Alves-Foss with cyber students

UNIVERSITY OF ILLINOIS AT SPRINGFIELD

UIS Campus

Located in the state capital, the **University of Illinois Springfield (UIS)** is one of three members of the University of Illinois system. The University serves approximately 5,000 students in 22 graduate and 30 undergraduate programs. The academic curriculum offers students a strong liberal arts core, a wide range of professional programs, and close faculty interaction. Making the most of its location in the state capital, UIS is broadly engaged in public policy and service. Its diverse student body includes traditional, non-traditional, and international students. Twenty-five percent of majors are in 17 undergraduate and graduate online degree programs and the campus has received several national awards for its implementation of online learning. UIS faculty are committed teachers, active scholars, and professionals in service to society.

The UIS Computer Science Department offers programs in Information Systems Security, Computer Science, and Data Analytics. The department prides itself on its small class sizes and distinguished faculty dedicated to research and teaching. Our classes are offered both online and on-campus in interactive virtual environments that enrich student experience and facilitate active learning. Our programs are known for their diverse curriculum, cutting-edge courses, student-centered learning, return on investment, and for producing well-prepared graduates for both professional careers and graduate schools. Students participate in cybersecurity competitions, work on real-life problems, and engage in research projects.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Dr. Sviatoslav Braynov
(217) 206-8245
sbray2@uis.edu

csc.uis.edu/center

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
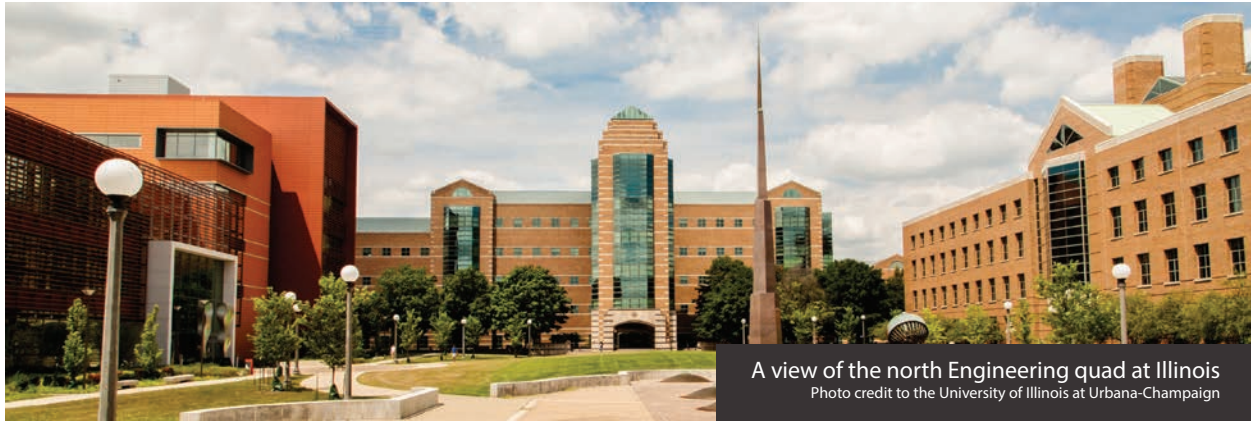
A view of the north Engineering quad at Illinois
Photo credit to the University of Illinois at Urbana-Champaign

Since its founding in 1867, the **University of Illinois at Urbana-Champaign** has earned a reputation as a world-class leader in research, teaching, and public engagement. With our land-grant heritage as a foundation, we pioneer innovative research that tackles global problems and expands the human experience. Entrepreneurship flows from our classrooms to our Research Park, a space that houses everything from Fortune 500 companies to student-founded startups. We are consistently ranked among the top five universities for NSF-funded research, and our total annual research funding exceeds $600 million.

The Illinois Engineering program is one of the highest-ranked in the world, and our students, faculty, and alumni set the standard for excellence. We have a large and growing pool of faculty and projects concentrating on cybersecurity, both in academic departments, such as Computer Science and Electrical & Computer Engineering, and in interdisciplinary research centers, such as the Coordinated Science Laboratory and the Information Trust Institute (ITI). ITI provides national leadership in the creation of trustworthy critical applications and cyber infrastructures. Over 200 ITI faculty affiliates are working to design complex systems that deliver predictable levels of reliability, security, privacy, safety, performance, and availability, even in the presence of unknowns.

The Center for Cyber Defense Education and Research at Illinois is in ITI. It advocates for and leads a variety of programs and events related to information assurance and cyber defense. Over 500 students take computer security courses every year at Illinois.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Roy H. Campbell
(217) 333-0215
rhc@illinois.edu

cae.illinois.edu

Photo credit to the
University of Illinois at Urbana-Champaign

KU

Cyber Blitz: the JayHackers , First Infantry Division and high school students

The Department of Electrical Engineering and Computer Science (EECS) and the Information and Telecommunication Technology Center (ITTC) at the **University of Kansas (KU)** are a designated National Centers of Academic Excellence in Cyber Defense Education.

The EECS Department offers five Bachelor of Science degrees, four Master of Science degrees and two Ph.D. degrees in Electrical Engineering, Computer Engineering, Computer Science, Interdisciplinary Computing, and Information Technology. The Department also offers a graduate certificate in Information Security and Assurance. KU ITTC performs research in security modeling and analysis, information security and privacy, network security, mobile security, CPS and IoT security, theoretical modeling, and high-assurance system synthesis and verification.

Several initiatives highlight KU's commitment to excellence in cybersecurity education, research and the overall student experience:

• KU is one of the six Science of Security Lablets funded by NSA Research Directorate to conduct foundational research in cybersecurity

• KU's CyberCorps®: Scholarship for Service (SFS) program provides scholarships for up to three years of support for cybersecurity undergraduate and graduate education

• KU's Information Security Club (the "Jayhackers") is a competition-based student group

• Cybersecurity research in KU has been supported by governement agencies and industry partners, including NSA, NSF, AFRL, NASA, Ripple, etc.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Fengjun Li
(785) 864-7707
fli@eecs.ku.edu

cae.ittc.ku.edu

KU's cybersecurity club, the JayHackers, participated in a recent cyber defense competition

UNIVERSITY OF LOUISVILLE

University of Louisville Campus

The **University of Louisville** is a state supported research university located in Kentucky's largest metropolitan area. It was a municipally supported public institution for many decades prior to joining the university system in 1970. The university has three campuses.

The 287- acre Belknap Campus is three miles from downtown Louisville and houses seven of the university's 12 colleges and schools. The Health Sciences Center is situated in downtown Louisville's medical complex and houses the university's health related programs and the University of Louisville Hospital. The 243-acre Shelby Campus is located in eastern Jefferson County.

Our institution provides cybersecurity program in two schools: the departments of Computer Engineering and Computer Science (CECS) and Computer Information Systems (CIS). The CECS department offers a graduate certificate in cybersecurity, which is designed to help advanced computer professionals who want to strengthen their knowledge and skills in the fast-changing field of cybersecurity, as well as for students majoring in disciplines who want to gain knowledge and skills in cybersecurity.

The CIS department offers an undergraduate certificate in information security. These programs provide educational, research, and service activities in cybersecurity, information assurance, forensics, and legal aspects of computing. Also, they aim to promote secure and ethical use of information technology throughout the university and the community at large.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Dr. Ghiyoung Im
(502) 852-4794
ghiyoung.im@louisville.edu

www2.cecsresearch.org/csi
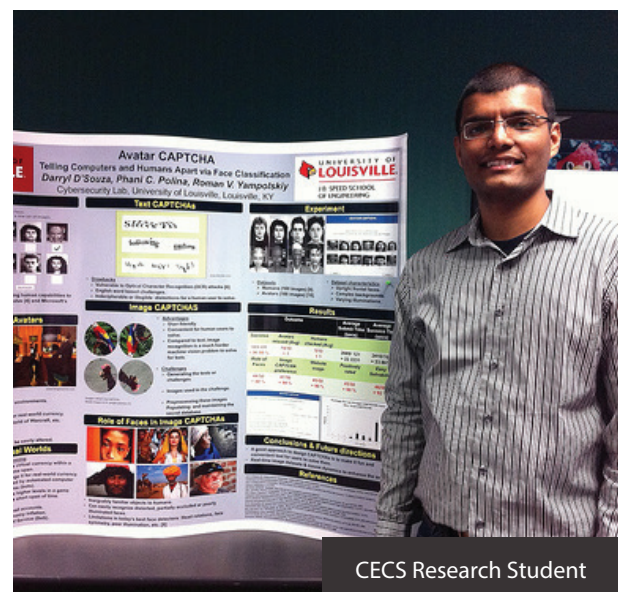
CECS Research Student

UNIVERSITY OF MAINE AT AUGUSTA

University of Maine at Augusta Campus

In 2014, the **University of Maine at Augusta (UMA)** was designated as a National Center of Academic Excellence in Cyber Defense Education, and as of 2019 we are still the only four-year institution in Maine to hold this designation.

In 2015, UMA started the Bachelor of Science in Cybersecurity degree program, dedicated to promoting the study and advancement of cybersecurity, with focus areas in cyber forensics, information assurance, and network security. Since inception, over 300 students enrolled in Information Security Systems (ISS) and Computer Information Systems (CIS) courses. Courses can be taken completely online, or through a combination of live, online, and ITV classes.

In 2018, the University of Maine System (UMS) and its member institutions of higher education

established the Maine Cybersecurity Center (MCC) as the designated Center for Cyber Education. The MCC is responsible for providing support and resources to any institution within the UMS that adopts the core academic program. The goal of the MCC is to provide the state of Maine with trained cybersecurity professionals by bringing together government, industry, and academia dedicated to workforce and economic development in the field of cybersecurity and information assurance.

In 2019, UMA launched the Maine Cyber Range (MCR). The mission of the MCR is to enhance cybersecurity education, as well as increase the number of fully prepared students entering the workforce. Our cybersecurity students use market-leading, commercially licensed security products, while a sophisticated attack generator runs a wide range of attacks providing the disruptive cybersecurity experience that professionals in these positions face every day. This mission extends to educating and supporting all universities with the UMS, colleges, municipalities, and public or private businesses in Maine and across New England.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Betina Tagle
(207) 621-3032
betina.tagle@maine.edu

uma.edu/cybersecurity

MAINE CYBER RANGE

MCR@maine.edu

UNIVERSITY OF MARYLAND

UMD Cyber Students

The **Maryland Cybersecurity Center (MC2)** is an academic center on the **University of Maryland (UMD)** campus that brings together faculty, researchers, and students working in the field of cybersecurity throughout campus. The Maryland Global Initiative for Cybersecurity also promotes and coordinates efforts across UMD to expand its cyber education, research, and development activities.

Our proximity to the nation's capital enables close interaction with federal agencies, and our location in the Maryland-DC-Virginia region makes UMD an ideal place for technology development and partnerships with industry. In addition to graduate level courses and undergraduate degree concentrations in cybersecurity within the A. James Clark School of Engineering and the College of Computer, Mathematical, and Natural Sciences, the Advanced Cybersecurity Experience for Students (ACES) seeks

to revolutionize cybersecurity education by emphasizing the need for students to master both technical and nontechnical skills. ACES, as an Honors College living-learning and minor program, draws together exceptional students of different backgrounds into teams that create comprehensive solutions to real-world problems.

UMD is unique in its comprehensive, interdisciplinary approach to cybersecurity, in that it brings together not only faculty with expertise in the core areas of computer science and electrical engineering, but also those with backgrounds in various multi-disciplinary areas. MC2 has particular strengths in cryptography, programming-language and software security, behavioral aspects of security, empirical security, and cybersecurity economics.

UMD ranks among the top 20 public research universities in the nation, with top-ranked departments in computer science and electrical and computer engineering. NSA has designated the University of Maryland as a CAE-R, and the university was also named an Intelligence Community Center of Academic Excellence by the Department of Homeland Security. The CyberCorps®: Scholarship for Service (SFS) program at ACES seeks to address cybersecurity education and workforce development through a grant from National Science Foundation.

DESIGNATIONS

• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Jonathan Katz
jkatz@cs.umd.edu
(301) 405-0794

cyber.umd.edu

UNIVERSITY OF MARYLAND BALTIMORE COUNTY

The Albin O. Kuhn Library at the University of Maryland, Baltimore County (UMBC)
Photo by Marlayna Demond for UMBC

The **University of Maryland, Baltimore County Center for Cybersecurity (UCYBR)** is an interdisciplinary university center that aims to provide both Maryland and the Nation with academic and research leadership, collaboration, innovation, and outreach in this critical discipline by streamlining our academic research, workforce development, and technology incubation activities to advance UMBC's position as a leading research university in cybersecurity-related disciplines.

At UMBC, students study cybersecurity by pursuing a BA or BS, MS, combined BS/MS, or PhD degree through programs in computer science, computer engineering, and information systems. These degrees are awarded through the Department of Computer Science and Electrical Engineering (CSEE) and Department of Information Systems, where there are tracks in cybersecurity at the undergraduate and graduate levels. UMBC offers scholarships for students to study cybersecurity under the DoD Cybersecurity Scholarship Program (CySP), NSF CyberCorps: Scholarship for Service (SFS), and UMBC CyberScholars.

Students at the UMBC Cyber Defense Lab (CDL) have special opportunities to engage in research opportunities, including at partner organizations. Selected current projects include protocol analysis, high-integrity voting systems including Scantegrity and the Random Sample Voting Project, and educational Cybersecurity Assessment Tools. In 2017, the UMBC CyberDawgs, a group of UMBC students, both undergraduate and graduate who share a common interest in computer and network security, won first place at the National Collegiate Cyber Defense Competition.

UMBC has been successful in recruiting, educating, and placing women and members of under-represented groups through the Meyerhoff Scholarship Program and the UMBC Center for Women in Information Technology.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Dr. Alan T. Sherman
sherman@umbc.edu

cisa.umbc.edu

Drs. Alan Sherman and Rick Forno meet with students in the CySP and SFS programs at UMBC.
Photo by Marlayna Demond for UMBC

UNIVERSITY OF MARYLAND GLOBAL CAMPUS

Conrad Shand, UMGC Cybersecurity Alumnus

Founded more than 70 years ago, **University of Maryland Global Campus (UMGC)** was created to serve working adults and service members. We are an online state university that offers undergraduate and graduate programs in fast-growing and in-demand fields. With no-cost digital course materials in nearly every course and locations in Maryland and at military installations around the world, we give you the opportunity to earn a respected degree from just about anywhere life takes you.

UMGC offers online and hybrid courses and a range of cybersecurity degrees, specializations, and certificates. These innovative programs are created and are continually updated with input from employers and cybersecurity experts and are taught by experienced scholar-practitioners who are leaders in their fields.

In order for students to gain hands-on experiences in detecting and combating cyber-attacks, UMGC offers a virtual lab that provides a secure environment. In addition, the cybersecurity program consistently receives high honors within the cybersecurity industry. In both 2018 and 2019, UMGC received the award for Best Cybersecurity Higher Education Program from SC Magazine. In addition, UMGC received an Academia Circle of Excellence Award from EC-Council in 2018.

The UMGC Center for Security Studies (CSS) provides educational resources, research activities, networking opportunities, and career training opportunities for working adults pursuing security studies, and works with industry and government to meet the cybersecurity and homeland security needs of the Nation. At present, CSS has produced more than 11,500 cybersecurity graduates, with more than 17,300 undergraduate and graduate students currently enrolled.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

UMGC
(855) 655-8682
css@umgc.edu

umgc.edu/cyber

S.K. Bhaskar, Associate Dean, UMGC School of Cybersecurity and Information Technology

THE UNIVERSITY OF MEMPHIS

CfIA is located in the FedEx Institute of Technology on the main UofM campus

The **Center for Information Assurance (CfIA)** at the **University of Memphis** was established in 2004. The long-term goal is to establish a regional hub for Cybersecurity Education and Research in collaboration with public and private sectors in the State of Tennessee with significant impacts on economic development, citizen privacy, and security.

The University's undergraduate and graduate degree/certificate programs are:

 • B.S. in Cybersecurity Concentration
 • Graduate Certificate in Cybersecurity
 • Graduate Certificate in Business Information Assurance
 • Graduate Certificate Program in Software Testing
 • PhD in Business Administration with research and dissertation in Business Information and Technology
 • PhD in Computer Science with research and dissertation in cybersecurity

The CfIA is a founding member of the National Cybersecurity Preparedness Consortium (NCPC). This five-university consortium is currently funded through DHS/FEMA grants to develop cybersecurity courses on Understanding Social Engineering Attacks (USEA), Mobile Device Security & Privacy (MDS/MDP), Cyber Identity & Authentication (CIAA) and Examining Advance Persistent Threats (EAPT).

 • Puzzle Based Cybersecurity Learning to Enhance Defensive Skills of Front-Line Technicians: A three-year NSF funded research collaboration with Jackson State Community College
 • Adaptive Multi-Factor Authentication (A-MFA): A project that aims to develop an A-MFA system.
 • GenCyber 2016 & 2017: Cybersecurity camp for Middle & High School students
 • Cyber Ambassador Tech Camp 2018
 • Professional Development Workshops

DESIGNATIONS

 • **CAE – Cyber Defense Education**
 • **CAE – Cyber Defense Research**

CONTACT INFORMATION

Dr. Dipankar Dasgupta
(901) 678-4147
ddasgupt@memphis.edu

memphis.edu/cfia

Dr. Dasgupta speaking at a recent tech seminar

UNIVERSITY OF MISSOURI COLUMBIA

MU Columbia Campus

The **University of Missouri, Columbia** was designated as an NSA Center of Academic Excellence in Research in 2019. As a member of the Association of American Universities (AAU), the University of Missouri is on the leading edge of innovation, scholarship, and solutions that contribute to scientific progress, economic development, security, and well-being.

The Cybersecurity Center at the University of Missouri is located within the College of Engineering. The faculty has active collaborations across different units that include engineering, information technology, business, law, medicine, social science, and mathematics. The cybersecurity research at the Cybersecurity Center is supported through research grants from US DOD agencies, including the US Naval Research Laboratory, US Army Research Laboratory, and National Security Agency, as well as

the National Science Foundation, and the US Department of Energy. Cybersecurity Center faculty are also actively engaging industry partners through the Cognitive Internet of Things – Industry Supported Consortium at the UM College of Engineering.

With a commitment to student success, the cybersecurity faculty successfully mentor several graduate students and postdoctoral scholars. Prior students have joined cybersecurity careers in industry and academia. Cybersecurity Center faculty lead a Scholarship for Service project titled "MASTER: Missouri Advanced Security Training, Education and Research" sponsored by the National Science Foundation that funds MS and Ph.D. students specializing in cybersecurity. The scholarship recipients go on to serve at federal agencies or national labs upon their graduation. The cybersecurity faculty also actively mentor high-school students by organizing the Network Forensics for HackerTrackers camp at the University.

DESIGNATIONS

• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Rohit Chadha
(573) 882-4899
chadhar@missouri.edu
engineering.missouri.edu/ceri-center/cybersecurity/

MU Cybersecurity Students

UNIVERSITY OF MISSOURI–ST. LOUIS

The **University of Missouri–St. Louis (UMSL)** is the largest public research university in eastern Missouri. It provides excellent learning experiences and leadership opportunities to a diverse student body whose influence on the region upon graduation is immense.

The departments of Information Systems and Technology (College of Business Administration) and Computer Science (College of Arts and Sciences) have teamed to create a multidisciplinary approach to developing the next generation of cybersecurity professionals. This approach engenders security thinking and skills at the interface of technical and business aspects of cybersecurity.

Given the fast pace of change in cybersecurity, our certificate programs strive to better meet student and market needs. Undergraduate and graduate cybersecurity degree programs are expected to launch in Fall 2019. In addition to research and teaching, faculty serve the community by organizing events such as a major cybersecurity conference, career fairs, capture-the-flag competitions for school and college students, and workshops, among others.

UMSL is home to the state-of-the-art Cybersecurity and Information Technology Innovation Lab (CITIL) dedicated to applied student learning and research. CITIL provides physical lab facilities and equipment, a fully virtualized sandboxed lab environment, and access to a self-service private cloud environment so that students can create any lab infrastructures they need. The private cloud environment was supported by a grant from the National Security Agency (NSA) and another NSA grant led to creation of IoT security coursework. UMSL is a proud member of the CAE community and grateful for the truly impactful and transformative CAE program.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Shaji Khan
(31) 516-6279
shajikhan@umsl.edu

cybersecurity.umsl.edu

Capture the Flag competition for school students

UNIVERSITY OF MONTANA
MISSOULA COLLEGE

Missoula College Campus

Missoula College (MC) delivers cybersecurity education through coursework, internships, apprenticeships, certifications, certificates of technical skills, two-year degrees, pathways to baccalaureate degrees, and community outreach. MC was designated as a National Center of Academic Excellence in Cyber Defense (CAE2Y-CD) by the National Security Agency (NSA) and Department of Homeland Security (DHS) in September 2017. The MC CAE2Y-CD is based upon four pillars of excellence:

• Relevant two-year college curricula mapping to Cyber Defense KUs designated by the NSA/DHS
• Qualified faculty with the appropriate credentials in cyber defense as recognized by the NSA/DHS
• An institutional culture of interdisciplinary cybersecurity education and best-practices
• Ongoing outreach and partnerships with the local community and industry partners

The Center provides community outreach in cybersecurity through high school dual-enrollment education programs, summer camps for middle school students, a cybersecurity higher education summit, and the annual Cybersecurity Awareness Week event. Associate degree students at Missoula College are required to participate in a work-based learning experience. The "Earn While You Learn" program provides students over 2000 hours of paid on-the-job training, while earning the associate degree and a credential from the Montana State Department of Labor & Industry.

MC is a CompTIA Academy, Cisco Networking Academy, a member of the Microsoft IMAGINE, and Amazon EDUCATE. Certifications are integrated into academic curriculum to validate industry-relevant skills. A local employer advisory committee meets regularly to advise, assist, and advocate for cybersecurity education at Missoula College.

DESIGNATIONS

• **CAE – Cyber Defense 2-Year Education**

CONTACT INFORMATION

Victor Valgenti
(406) 243-7913
Victor.Valgenti@umontana.edu

mc.umt.edu

Cybersecurity Competition at Missoula College

UNIVERSITY OF NEBRASKA AT OMAHA
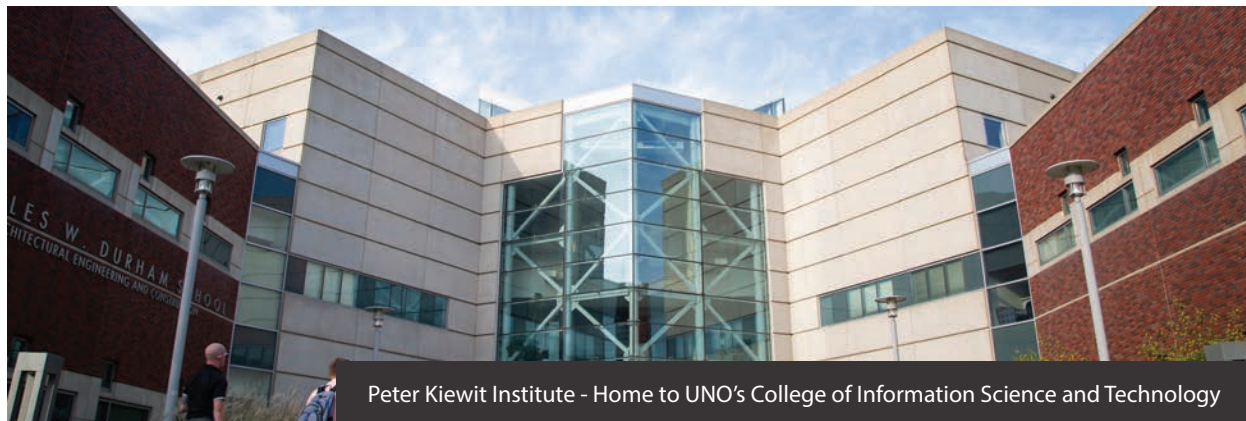
Peter Kiewit Institute - Home to UNO's College of Information Science and Technology

At the **University of Nebraska at Omaha (UNO) College of Information Science and Technology (IS&T)**, the cybersecurity programs give students exposure to a broad range of issues related to information and network security. The courses that constitute this major provide students with the necessary skills to conduct a risk assessment, develop information security policies, identify critical issues for electronic commerce, resolve critical issues for various operating systems, and apply this knowledge to intrusion events. Driven by the motto that no student shall go unchallenged or unsupported, the cybersecurity program has been ranked as the nation's top cybersecurity program from a public university by the Military Times.

The CAE-CO program at IS&T is intended to be a highly technical, interdisciplinary, higher education program firmly grounded in computer science, computer engineering, and technical cybersecurity, with extensive opportunities for hands-on applications via labs and exercises. The program provides a particular emphasis on technologies and techniques related to specialized cyber operations such as collection, exploitation, and response to enhance the national security posture of our nation. These technologies and techniques are critical to intelligence, military, and law enforcement organizations authorized to perform these specialized operations.

For over 20 years, IS&T has been delivering ground-breaking information technology education right in the heart of the Midwest. With 13 degree programs, IS&T has a unique multidisciplinary environment that encourages collaboration and student support. A diverse and welcoming atmosphere, IS&T is answering the Nation's urgent call for more talented IT leaders in the workforce.

DESIGNATIONS

- **CAE – Cyber Defense Education**
- **CAE – Cyber Operations**

CONTACT INFORMATION

Dr. William Mahoney
wmahoney@unomaha.edu
(402) 554-3819

cist.unomaha.edu/cyberops

Dr. Robin Gandhi, an associate professor in cybersecurity, addresses a cybersecurity class at IS&T

UNLV

UNIVERSITY OF NEVADA, LAS VEGAS

UNLV Campus

The **University of Nevada, Las Vegas (UNLV)** Computer Science Department was designated as a National Center of Academic Excellence in Cyber Defense Education in 2019. Its Information Assurance program emphasizes research and education in the broad issues of developing trustworthy information systems and the cybersecurity workforce shortage. The core faculty members specialize in network security, computer forensics, cryptography, security data analytics, and blockchain security. They produce highly trained graduates at B.S., M.S. and Ph.D. levels. UNLV has also recently created an interdisciplinary cybersecurity M.S. program. Students are educated with a sound understanding in cyber law, risk management, emergency response, control frameworks, and the technologies involved in a rich and deep cybersecurity environment.

UNLV is an accredited test center approved by EC-Council and regularly offers Certified Ethical Hacker (CEH) training classes and exams. Community involvement is a crucial part of the program providing financial support for certifications, mentors, lecturers, internships, and employment opportunities. Situated at the home of Black Hat and DEFCON conferences, UNLV students regularly participate in security conferences and competitions.

UNLV, a Title III & V Minority- and Hispanic-serving institution, has consistently been listed as the most diverse campus for undergraduate students in U.S. News & World Report since 2017. It has also been ranked an R1 "very high research" institution by the Carnegie Classification of Institutions of Higher Education. UNLV aims to be an institution of choice in the southwest U.S. for those wanting to start a career in cybersecurity.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Juyeon Jo
(702) 895-5873
Juyeon.Jo@unlv.edu

unlv.edu/program/cybersecurity

UNLV Cyber Students

UNIVERSITY OF NEW HAMPSHIRE

UNH Durham Campus

The **University of New Hampshire (UNH)**, the state's flagship public research university, received its designation as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) by the NSA and DHS in 2019. UNH is the only institution in the state to earn this specialized designation for its commitment to building a cybersecurity workforce and helping organizations manage their cybersecurity risks.

To further cultivate future cybersecurity leaders and more broadly engage relevant communities, UNH created the Center for Cybersecurity Leadership, Education, and Outreach (CCLEO). Aligned with the CAE-CDE designation, CCLEO focuses on cybersecurity education and training as well as external outreach and support to businesses and government agencies in New Hampshire and beyond.

Leveraging the expertise of UNH faculty and industry partners, the Center also provides resources to help build resilience, manage risks, and respond to cybersecurity incidents. Our cybersecurity degree programs and CCLEO activities emphasize the multidisciplinary approach necessary to whole-of-organization and whole-of-community solutions for cybersecurity.

UNH earned the CAE-CDE designation based on its homeland security bachelor's degree program, which is offered at both the Durham and Manchester campuses. UNH also offers a bachelor's degree in computer science with a concentration in cybersecurity (Durham), as well as graduate programs in cybersecurity engineering (Manchester) and cybersecurity policy and risk management (online). UNH will soon be adding a master's program in national security intelligence analysis to its security studies portfolio.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

James Ramsay
(603) 641-4308
james.ramsay@unh.edu

unh.edu/ccleo

Homeland security students with professor.

University *of* New Haven

UNH Campus

The **University of New Haven** received its designation as a National Center of Academic Excellence in Cyber Operations by the National Security Agency in 2019. The designation recognizes the university's programs in cybersecurity and networks and computer science, which reside in the school's Tagliatela College of Engineering. Cutting-edge research conducted by the university's Cyber Forensics Research and Education Group played an important role in receiving the designation.

The University of New Haven is the only university in Connecticut, and one of only two in New England and 21 in the country, to earn this distinction. Students learn in cutting-edge facilities, including the Samuel S. Bergami Cybersecurity Center. They have uncovered security issues affecting 1.5 billion people worldwide and have excelled in white-hat hacking in numerous competitions, defeating schools with cybersecurity enrollments that are five times larger. The university has the only cyber forensics research laboratory in Connecticut, and the first Women in Cybersecurity (WiCyS) chapter in Connecticut.

The university's programs have attracted major grants, including a $4 million grant from the National Science Foundation to establish Connecticut's first Scholarship for Service (SFS) program, preparing students to work with federal, state, or local government organizations to prevent cyberattacks. The university received a $300,000 grant for its groundbreaking Artifact Genome Project, helping aspiring cybersecurity and digital forensic professionals to learn how to identify digital artifacts. Faculty receive funding from a variety of sources, including NSF, NSA, DHS, MITRE, and the Office of Naval Research.

DESIGNATIONS

• CAE – Cyber Operations

CONTACT INFORMATION

Dr. Ibrahim (Abe) Baggili
(203) 932-7198
IBaggili@newhaven.edu

newhaven.edu

UNH Cybersecurity Class

UNM McKinnon Center for Management at the Anderson School of Business

University of New Mexico Anderson faculty members have developed a program that is unique in the country, if not the world, with the following characteristics and benefits to students:

• Master's of Information Systems and Assurance offered through UNM's Anderson School of Management
• Partnership with the FBI and its Regional Computer Forensics Lab (RCFL), housed at UNM, through training, student internships, and co-ops
• A partnership with the Department of Energy's first satellite office for the Center for Cyber Defenders through Sandia National Laboratories
• The Metro Law Enforcement Internship program designed for students to work with local crime units
• A designation from the National Security Agency (NSA) and the Department of Homeland Security (DHS) as a Center of Academic Excellence in Cyber Defense Education (CAE-CD) and Research (CAE-R)

UNM also offers an Information Assurance Scholarship for Service Program. The UNM Information Assurance Scholarship for Service (SFS) program is funded through a National Science Foundation grant to provide scholarships to complete a master's degree in the information assurance (IA) field.

UNM SFS students have been placed in internships and careers at the Department of Defense, Department of Homeland Security, Department of Treasury, Environmental Protection Agency, Federal Bureau of Investigation, Federal Reserve Bank, Los Alamos National Labs, National Institute of Standards, National Security Administration, Sandia National Labs, and Securities and Exchange Commission.

DESIGNATIONS

• **CAE – Cyber Defense Education**
• **CAE – Cyber Defense Research**

CONTACT INFORMATION

Dr. Stephen Burd
burd@unm.edu

Alex Seazzu
roma@unm.edu

ia.mgt.unm.edu

Cyber Security camp held at UNM Anderson

UNIVERSITY OF NORTH CAROLINA WILMINGTON

The UNCW Center for Cyber Defense Education is located in the Computer Information Systems building

The **University of North Carolina Wilmington (UNCW)** received the NSA/DHS CAE-CDE designation in September 2018. The Information Technology major with Cybersecurity minor is the designated CAE-CDE curriculum path and is an interdisciplinary course of study shared by the Department of Computer Science and the Department of Business Analytics, Information Systems, and Supply Chain (formerly ISOM). The UNCW Center for Cyber Defense Education was established in anticipation of CAE-CDE designation with the stated purpose to strengthen the cybersecurity aptitude of our entire community of scholars so they are equipped to wisely balance the unique risks of living in an all-digital future. Leading up to the decision in Fall 2017 to seek CAE-CDE designation, many UNCW staff, faculty, and students contributed to the continual advancement of

UNCW's cybersecurity strength. Among this large group, a few key players were Professors Ulku Clark (CCDE Director) and Ron Vetter who laid years of groundwork and student veteran Jay Richardson (2020) who was instrumental in invigorating the idea that UNCW take the step to seek formal recognition via CAE-CDE designation. A good indicator of UNCW's cybersecurity expertise is the cyber defense club's (CDC) record since being founded in 2012 of progressing past the annual virtual prelim qualifier to the on-site Southeast Regional Collegiate Cyber Defense Competition. UNCW is one of four regional institutions with the best qualification record (six out of seven years) since 2012. UNCW has been continually adding and improving cybersecurity content across much of the entire University's curriculum for many years and plans to accelerate along this trajectory.

DESIGNATIONS

• **CAE - Cyber Defense Education**

CONTACT INFORMATION

Ulku Clark
(910) 962-3901
clarku@uncw.edu

csb.uncw.edu/ccde

Veteran Jay Richardson '20 plans to earn a degree in computer information technology with a cybersecurity minor and played an instrumental role in UNCW's decision to apply for the CAE-CDE designation

UNIVERSITY OF NORTH GEORGIA

UNG Dahlonega Campus

The **Center for Cyber Operations Education at the University of North Georgia (UNG)** develops highly capable cyber professionals and leaders for the private, non-profit, military, and government sectors. UNG is designated by the NSA and Department of Homeland Security as a National Center of Academic Excellence in Cyber Defense (CAE-CD). UNG is also designated as a University System of Georgia leadership institution and is The Military College of Georgia, one of six federally-designated Senior Military Colleges in the nation.

UNG offers a Bachelor of Science degree in Cybersecurity, a Graduate Certificate in Cybersecurity, two degree concentrations, and two minors. The Department of Computer Science and Information Systems (CSIS) has offered the Concentration in Information Assurance and Security (IAS) as part of the Bachelor of Science degree in Computer Science since 2004 and serves more than 1,200 students in the department and in related majors taking cybersecurity courses.

The Department of CSIS offers the Information Assurance and Security Minor, and, jointly with the Department of Criminal Justice, the Minor in Cybersecurity, to add value to any undergraduate major across all disciplines. The interdisciplinary Bachelor of Arts degree in Strategic and Security Studies offers a Concentration in Cybersecurity for students interested in military, government, or intelligence careers.

The nationally-ranked CyberHawks cyber competition team participates in more than a dozen cyber competitions per year and provides opportunities for student certifications and conference travel.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Bryson Payne
(706) 864-1694
bryson.payne@ung.edu

ung.edu/cyber

UNG Cybersecurity Course

THE UNIVERSITY OF RHODE ISLAND

The University of Rhode Island Campus

The **University of Rhode Island's Digital Forensics and Cyber Security Center (DFCSC)** is a multi-disciplinary hub on the Kingston, RI campus that harnesses the resources of Computer Science, Electrical and Computer Engineering, and the Office of Information Technology. Established in 2004 with a grant from the U.S. National Science Foundation, the DFCSC provides courses and degree programs, research, services, and consulting in digital forensics, information assurance, and cybersecurity. Its research objective is to formulate new concepts that help digital forensics and cybersecurity professionals protect the nation's citizens. The DFCSC also focuses on preparing the workforce of tomorrow through extensive outreach into K-12 education in computer science, data science, and cybersecurity.

The DFCSC members work closely with a number of different academic institutions, government organizations, state and local law enforcement agencies, and private companies. We draw on the expertise of these partners to help in developing digital forensics and cybersecurity related capabilities and guiding the direction of DFCSC projects and education. The Digital Forensics and the Cybersecurity programs approach teaching as a mixture of academic and practical points of view. This hybrid approach allows students to build a strong foundation and expand their knowledge by applying real-world techniques and tools to the subjects being taught. Students also leverage the close knit nature of the State of Rhode Island to obtain experience through internships, job shadowing, and apprenticeships.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Lisa DiPippo, Ph.D.
(401) 874-2701
ldipippo@uri.edu

dfcsc.uri.edu

UNIVERSITY OF SOUTH ALABAMA

The School of Computing is located in Shelby Hall

The **University of South Alabama** School of Computing has been a National Center of Academic Excellence in Information Assurance / Cyber Defense Education since 2011 and was re-designated in 2014 under the new program criteria. USA School of Computing is unique to the state where all computing disciplines are housed in the same academic unit. This centralization allows for faculty and students unique opportunities to collaborate through academics, research, internships, and technology transfer. The School offers ABET accredited degrees in Computer Science, Information Systems, and Information Technology, as well as a degree in Health Informatics.

At the graduate level, Master's students are awarded a degree in Computer and Information Sciences with a focus in Computer Science or Information Systems. Our PhD in Computing degree integrates coursework and research projects from computer science, information systems, and information technology, merging different perspectives and creating impactful advancements in areas such as cybersecurity, digital forensics, big data, and cloud computing. Students gain sound preparation for a wide variety of information assurance careers and for continuing their education to the terminal degree.

Our programs provide both a strong theoretical foundation and practical hands-on experience in the core aspects of security. In coordination with our Center for Forensics, Information Technology and Security, students at all levels can participate in research and internships beginning as early as the freshman year. Students completing the mapped CAE curriculum are awarded IA certificates upon completion of the program.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Dr. Alec Yasinsac
(251) 460-6390
soc@southalabama.edu

southalabama/colleges/soc

Center for Forensics,
Information Technology and Security

UNIVERSITY OF SOUTH CAROLINA

Engineering and Computing (UofSC logo)

UofSC Campus

The **University of South Carolina (UofSC)**, founded in 1801, is one of the three research universities of South Carolina. The College of Engineering and Computing hosts the departments of Computer Science and Engineering, the primary unit for the CAE-CDE and CAE-R designations, and Integrated Information Technology. The mission of these departments is to provide undergraduate and graduate instruction, to undertake research in computing and information technology, and to serve the community and the profession.

UofSC has offered cybersecurity courses and programs since 2000. Cybersecurity research accomplishments of our faculty and students are demonstrated by externally funded grants, peer-reviewed conference and journal publications, and graduation and placement of our students.

Faculty and staff of UofSC are actively reaching out to local industry and educational institutes to promote cybersecurity collaboration and awareness. A small sample of our collaborative efforts include those with The Citadel, Clemson University, Trident Technical College, and local HBCUs. In 2019, UofSC and the Medical University of South Carolina jointly hosted the 33rd annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy in Charleston.

UofSC works with the South Carolina National Guard and the Naval Information Warfare Center Atlantic to develop state-level cybersecurity capabilities. At the national level, UofSC signed an Educational Partnership Agreement with the Air Force Research Laboratory Information Institute in 2013, leading to research collaborations and student internships. UofSC also strengthened collaboration with national laboratories and agencies, such as Savannah River and ESnet, by providing internship opportunities to our students and by co-organizing technical workshops.

DESIGNATIONS

- **CAE – Cyber Defense Education**
- **CAE – Cyber Defense Research**

CONTACT INFORMATION

Csilla Farkas
(803) 576-5762
farkas@cec.sc.edu

cse.sc.edu/isl

The Storey Innovation Center hosts the Departments of Computer Science and Engineering (CSE) and Integrated Information Technology (IIT)

USF Campus

UNIVERSITY OF SOUTH FLORIDA

The **University of South Florida (USF)** has distinguished itself as a leader in the cyberdefense and cybersecurity domains and is also home to the Florida Center for Cybersecurity. USF currently offers an impressive breadth of interdisciplinary, cybersecurity-specific degree and certificate programs (at both the undergraduate and graduate levels) and is conducting a wealth of innovative research under the guidance of renowned faculty scholars.

In particular, the undergraduate programs include Florida's first B.S. in Cybersecurity, a B.S. in Information Studies with a concentration in Information Security, a B.S. in Business Analytics and Information Systems with a concentration in cybersecurity, and an undergraduate certificate in Foundations of Cyber Security. Meanwhile, graduate programs include the M.S. in Cybersecurity with concentrations in Digital Forensics, Cyber Intelligence, Computer Security Fundamentals, and Information Assurance; an M.A. and M.S. in Cybercrime; an M.S. in Intelligence Studies with a concentration in Cyber Intelligence; an M.S. in Learning Design and Technology with a concentration in Cybersecurity Education; and an M.B.A. with a concentration in Cybersecurity. A range of graduate certificates are also offered in Cyber Intelligence, Digital Forensics, Information Assurance, and Cybersecurity Education and Awareness.

Additionally, USF faculty are engaged in a range of interdisciplinary research projects spanning many diverse cyberdefense areas, including but not limited to cyberphysical and IoT systems security, network privacy and security, secure software systems, persistent threat detection, human factors and Internet safety, applications of machine learning.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**

CONTACT INFORMATION

Dr. Nasir Ghani
(813) 974-4772
nghani@usf.edu

cyberflorida.org

Cyber Florida CTF

UNIVERSITY OF TENNESSEE AT CHATTANOOGA

UTC Engineering, Math, & Computer Science Building

The **University of Tennessee at Chattanooga (UTC) InfoSec (Information Security) Center** located within the College of Engineering and Computer Science, and in collaboration with the College of Business, College of Art and Science, and College of Health, Education and Professional Studies. The UTC InfoSec Center was designated as a National Center for Academic Excellence for Cyber Defense (CAE-CD) from NSA and DHS.

The mission of the Center is to serve as a regional model for promoting excellence in information security education, assisting businesses, government agencies, education institutions and industry in their information security needs, and serving as the first point of call for any information security emergency. The Computer Science department offers courses, as well as, concentrations in Cybersecurity at both the undergraduate and graduate levels.

The CAE-CD Center strives to:

- Prepare students to meet the challenges posted by the rapid developments in information technologies and the corresponding emergence of new threats and attacks on the critical information infrastructure upon which our society has come to depend
- Provide working professionals with the security skills and best practices needed to meet the workplace challenges resulting from current advances in computer technology
- Promote excellence in information security research by keeping abreast of developments in emerging areas
- Serve the University and the surrounding communities with leadership and distinction

DESIGNATIONS

- **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Li Yang
(423) 425-4392
Li-Yang@utc.edu

utc.edu/cae-cd

UTC team competing in the Department of Energy (DoE) CyberForce competition in the Oak Ridge National Lab.

The Erik Jonsson School: The home of our Cybercorps program at UT Dallas

Over the past 15 years, cybersecurity has become one of the key areas of strength at **The University of Texas at Dallas (UT Dallas)**. In 2004, UT Dallas established its CyberSecurity Research and Education Institute (CSI) with a mission to be a national resource for the government, industry, and academia by conducting cutting edge interdisciplinary research. By providing comprehensive education in all aspects of cybersecurity, students are equipped with the skills needed to carry out cyber operations. Today, CSI houses 10 core and over a dozen affiliated faculty members conducting funded research and supervises over 40 PhD students in cybersecurity. UT Dallas has been designated as a CAE in Cyber Defense Education since 2004. The curriculum requirements of this program are mapped to several graduate courses in computer science and students fulfilling these requirements are awarded these graduate certificates.

UT Dallas has also held a CAE in Cyber Defense Research since 2008. This designation acknowledges the research work performed by our faculty in various areas of cybersecurity. UT Dallas obtained its designation as a CAE in Cyber Operations in 2015. The curriculum requirements of this program are mapped to a number of graduate courses in computer science. Students completing these courses receive notations in their academic transcripts recognizing their achievement. These CAE designations enabled UT Dallas to compete in NSA and NSF scholarship programs which have graduated over 40 domestic students and placed them into related government jobs. The designation also enabled our faculty to receive competitive NSA funding to conduct research in cyber defense.

DESIGNATIONS

- CAE - Cyber Defense Education
- CAE - Cyber Defense Research
- CAE - Cyber Operations

CONTACT INFORMATION

Rhonda Walls
Rhonda.Walls@utdallas.edu

csi.utdallas.edu

UT Dallas Cybercorps Scholarship for Service team receiving renewal award.

![UTSA logo]

UNIVERSITY OF TEXAS AT SAN ANTONIO

Business students receive hands-on applied training in our cybersecurity program

Today's world calls for greater collaboration to protect America's national security infrastructure. **University of Texas at San Antonio (UTSA) is** leading this charge, armed with the most powerful cyber, computing, cloud and data analytics teams of faculty, government professionals, and business professionals, along with our students. Now, with the vision of a new National Security Collaboration Center and a proposed School of Data Science becoming reality on our Downtown Campus, UTSA is the undisputed leader in cybersecurity education.

UTSA defends cyber space through creative approaches in business, science, and engineering, and liberal and fine arts. Five centers and institutes advance that work, which focuses on solving global security challenges in today's increasingly technological world.

San Antonio is among the nation's largest cybersecurity hubs and home to the largest concentration of cybersecurity experts and industry leaders outside Washington, D.C.

UTSA's cybersecurity graduates are heavily recruited and are employed quickly. They are hired in governmental positions and with top national/international commercial companies.

UTSA students can specialize in cybersecurity, computer science, computer engineering or information systems. Additional programs are offered in data center design, network and data center management, digital forensics and data analytics. In fall 2017, UTSA began offering a fully online B.B.A. in Cyber Security.

DESIGNATIONS

- CAE - Cyber Defense Education
- CAE - Cyber Defense Research
- CAE - Cyber Operations

CONTACT INFORMATION

Dr. Glenn Dietrich
(210) 458-5354
Glenn.Dietrich@utsa.edu

bit.ly/2HIYEqQ

UTSA's Main Campus is home to more than 32,000 students and is the largest university in San Antonio

UNIVERSITY OF THE CUMBERLANDS

UC Campus

The **University of the Cumberlands** was founded in 1888 in Williamsburg, Kentucky, a bucolic, small town along the Appalachian Foothills. It is grounded in Christian principles, and promotes leadership through service to students from all backgrounds through broad-based academics. Its vision to be a university of distinction has driven its innovation and growth, and now supports more than 15,000 students from all over the world.

Initially, the attention given to cybersecurity focused on the MS Information Systems Security program developed in 2014. As the program of study that earned the CAE-CDE designation, it was mapped directly to the Department of Homeland Security and National Security Agency cybersecurity education standards, and aligns with the (ISC)2 CISSP Common Body of Knowledge. Thousands of students have earned their MS ISS since its inception.

Complementing the CAE-CDE program of study, UC has continually grown its cybersecurity influence. The BS Information Technology degree offers undergraduates a cybersecurity specialization. An MS Digital Forensics program began in 2017, and now offers criminal justice and cybersecurity specializations. The PhD Information Technology track offers two content specializations that prepare leaders for cybersecurity service. Additional curricular development surrounding cybersecurity continues.

UC recognizes the imperative charge to reduce vulnerabilities, promote education, and produce professionals with cybersecurity expertise. Serving as part of the CAE Community represents an important piece of UC's 132-year history. Today, with faculty spanning the country, students spanning the globe, and satellite campuses from Washington, DC to Seattle, Washington, we are proud to contribute to and benefit from this community.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Donnie Grimes
(606) 539-4197
Donnie.grimes@ucumberlands.edu

ucumberlands.edu/center-cyber-security

THE UNIVERSITY of TULSA

The University of Tulsa is a private, doctoral-degree granting research institution in Tulsa, Oklahoma

The University of Tulsa (TU) has been a designated Center of Academic Excellence in Cyber Defense since 2000 and was one of the first 14 institutions awarded this distinction. TU also is recognized as a CAE in Research and Cyber Operations. TU cybersecurity alumni are employed worldwide in leading roles among the private and public sectors, as well as academia.

TU offers multiple programs for students who want to advance in cybersecurity education. At the undergraduate level, students from disciplines across the university can pursue a minor in cybersecurity. Graduate students can earn master's degrees in cybersecurity and computer science. The Master of Science in Cybersecurity offers an online professional track degree, as well as an accelerated option. The Ph.D. degree in computer science targets graduate students seeking a career in research and scholarship. TU has a long-standing reputation for excellence in cybersecurity research with campus projects supported by the National Security Agency, U.S. Department of Defense, National Science Foundation, U.S. Department of Energy, the U.S. Department of Transportation, the National Institute of Justice and the Defense Advanced Research Project Agency.

Armed with a high-quality education and valuable experience in research and real-world scenarios, TU's cybersecurity graduates are well equipped to serve in intellectually stimulating and personally rewarding roles that strengthen national and global security. Graduates are grounded in the theory, concepts and techniques of information assurance, and network defense and apply them in real-world settings.

DESIGNATIONS

• **CAE - Cyber Defense Education**
• **CAE - Cyber Defense Research**
• **CAE - Cyber Operations**

CONTACT INFORMATION

John Hale
(918) 631-2745
john-hale@utulsa.edu

utulsa.edu/cyber

TU computer science and cybersecurity students regularly participate in cybersecurity competitions

UNIVERSITY OF VIRGINIA

University of Virginia Central Grounds

In 1819, Thomas Jefferson founded the **University of Virginia (UVA)** and inaugurated a bold experiment – a public university designed to advance human knowledge, educate leaders, and cultivate an informed citizenry. Two centuries later, this vision is thriving. Across grounds and throughout the world, UVA students, faculty, staff, and alumni challenge convention, break barriers, and pursue the greater good.

The Department of Computer Science in the School of Engineering and Applied Science promotes cybersecurity education and research in its undergraduate and graduate levels. The Computer Science graduate program aims to produce well-educated researchers, teachers, and future leaders in computer science. The department offers a Bachelor of Science in Computer Science, a Bachelor of Arts in Computer Science, and a

Bachelor of Science in Computer Engineering. Students in our program who go through our Cybersecurity Focal Path receive a letter of completion which is designated by the NSA and DHS.

UVA is active in national competitions to help our students and faculty stay familiar with cutting-edge techniques. UVA and its partner GrammaTech, took second place in DARPA's 2016 Cyber Grand Challenge finale, showcasing next-generation technologies for software vulnerability discovery and application hardening. The student-led Computer and Network Security Club at UVA participates in national Capture the Flag events and cybersecurity competitions. Our Cyber Defense team won the 2018 National Collegiate Cyber Defense Competition. The department hosts a GenCyber camp during the summer to introduce the foundations of cybersecurity to high school teachers and promote cybersecurity in K-12 education.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Ahmed Ibrahim
(434) 924-8284
a.i@virginia.edu

cyberinnovation.virginia.edu

Cyber Defense Team

UNIVERSITY OF WASHINGTON

University of Washington Campus - Bothell

The **University of Washington (UW)** is ranked No. 14 in the world (No. 3 among U.S. public universities) according to the 2018 Academic Ranking of World Universities published by the Shanghai Ranking Consultancy. UW graduates 54,000 students annually and is one of the most successful public research universities with over $1.5 billion in grants and contracts annually. UW Medicine ranks No. 1 for primary care education; Computer Science and Engineering ranks among the top 5 in the nation. We are known for a proud culture of innovation, collaboration, and discovery that has transformational impact.

Formed in 2004, the UW Center for Information Assurance and Cybersecurity (CIAC) headquartered at Bothell, prepares cybersecurity professionals as breach-ready, critical thinkers. As one of the NSA's

Regional Resource Centers, CIAC was recognized in 2014 by the Ponemon Institute as among the top ten places in the world to study cybersecurity. We take a "rules & tools" perspective, treating cybersecurity as an interdisciplinary field of study. Taking a systems approach, we are known for cross sector collaborations with industry, military, government, and academia that have produced successful programs like our cooperative learning approach piloted with a leading industry partner.

Under Dr. Endicott-Popovsky's leadership, CIAC has earned both CAE-CDE and CAE-R designations, founded the Pacific Rim Collegiate Cyber Defense Competition (PRCCDC) coming in first at nationals in 2010 and 2011, received recognition from UPCEA for best for-credit certificate, as well as numerous teaching and curriculum awards.

DESIGNATIONS

- **CAE - Cyber Defense Education**
- **CAE - Cyber Defense Research**

CONTACT INFORMATION

Dr. Barbara Endicott-Popovsky
(206) 240-0345
endicott@uw.edu

ciac.uw.edu

UW Cybersecurity Students

UNIVERSITY OF WEST FLORIDA

UWF Center for Cybersecurity

The **University of West Florida (UWF)** advances cybersecurity innovation through nationally-recognized programs, research, and the Center for Cybersecurity. UWF offers the only stand-alone CAE-designated Bachelor of Science in Cybersecurity in Florida in addition to multidisciplinary undergraduate and graduate programs and certificates in cybersecurity and related fields. UWF provides leadership to advance cybersecurity education among colleges and universities in Alabama, Florida, Georgia, Mississippi, Puerto Rico, and South Carolina. A program agreement between the NSA and UWF allows students who complete the Joint Cyber Analysis course to earn credits toward the B.S. in Cybersecurity. The CyberCorps®: Scholarship for Service program at UWF prepares students for cybersecurity roles in government.

UWF launched the Cybersecurity for All® program and Florida Cyber Range to address the critical shortage of qualified cybersecurity professionals via competency-based education and hands-on skills development. The program helps individuals re-skill or up-skill for evolving cybersecurity roles. UWF leads a variety of K-12 outreach initiatives, including CyberPatriot and CyberThon and for the past three years, hosted the only NSA/NSF funded GenCyber camps in Florida. The UWF Cybersecurity Ambassadors program enhances cybersecurity awareness and interest among K-12 students. UWF partnered with the State of Florida to enhance cybersecurity resiliency and workforce development through cutting-edge training for state agency personnel and elections personnel.

In 2019, UWF hosted the CAE Executive Leadership Forum at Pensacola Beach. The Forum brought together around 400 executives from academia, industry, and government to advance cybersecurity innovation through collaboration.

DESIGNATIONS

- CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Eman El-Sheikh
(850) 474.3074
eelsheikh@uwf.edu

uwf.edu/cybersecurity

2019 CAE Executive Leadership Forum hosted by UWF on Pensacola Beach

UNIVERSITY OF WISCONSIN-STOUT

University of Wisconsin - Stout Campus

University of Wisconsin - Stout is a comprehensive, career-focused, polytechnic university. Our students, faculty and staff use applied learning, scientific theory and research to solve real-world problems, grow the state's economy, and serve society. Located in scenic Menomonie, Wisconsin, our campus has a long and rich history of providing a distinct array of programs. Our students enjoy a 98.2% rate of finding employment or continuing their education after they graduate. We're proud of our tremendous industry partnerships and our contribution to the local and regional economy.

UW-Stout Computer Networking & Information Technology (CNIT) program provides students with the strong technical, communication, teamwork, leadership, and problem-solving skills that students need to succeed. Students take courses in emerging fields such as:

- Ethical Hacking and Pen Testing
- Virtualization
- Wireless Networking and Security
- Network Infrastructure
- Server Administration
- Linux/Unix Network Administration
- Cloud Computing Design, Implementation, and Security
- Python, Java, C++, Web Programming and Network Automation
- Project Management

CNIT students are required to do capstone projects with IT Industry partners before graduation. Many of our students have internship or co-op experience. The CNIT program path has been used as a program path for getting the CAE designation in November 2017.

DESIGNATIONS

- **CAE - Cyber Defense Education**

CONTACT INFORMATION

Holly Yuan
(715) 232-1697
yuanh@uwstout.edu

www.uwstout.edu

2016 CNIT students place 1st & 3rd at AITP

UTICA COLLEGE

UC Economic Crime, Justice Studies, and Cybersecurity Building

Utica College is located in the heart of the Mohawk Valley yet maintains a global virtual presence. As a military-friendly college, Utica College was the first college in the nation to achieve both the designation as a National Center of Academic Excellence in Cyber Defense Education by the National Security Agency and the Department of Homeland Security, as well as the Center of Digital Forensics Academic Excellence by the Defense Cyber Crime Center. As pioneers in cybersecurity education, Utica College positions its students for success by forming strategic relationships with industry partners to keep the curricula relevant and encourage job placement for students upon graduation.

Utica College's undergraduate and graduate programs are each designated as CAEs in Cyber Defense Education. Offering their undergraduate courses on campus and online, students have the option to specialize in Cybercrime and Fraud Investigation, Network Forensics and Intrusion Investigation, Cyber Operations, and Information Assurance. The Master of Science graduate program is offered entirely online, and specializations include Computer Forensics, Cyber Operations, Electronic Crime, Intelligence, and Malware Analysis.

The cybersecurity curriculum at Utica College provides a unique blend of cybersecurity, criminal justice, and fraud and financial crime investigations. The college is proud of its world-renowned cybersecurity faculty. As practitioners in the space, Utica College faculty are well versed in how to bridge the gap between the real-world and classroom, further echoing the college's ability to prepare students for the cybersecurity workforce.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. Leslie Corbo
lecorbo@utica.edu

utica.edu

UC Cyber Classroom

VIRGINIA COMMONWEALTH UNIVERSITY

VCU College of Engineering

The **Virginia Commonwealth University (VCU)** Cybersecurity Center is the hub of the university's cybersecurity education activities. VCU provides leadership to advance cyber defense education and cybersecurity support throughout the region.

The VCU Cybersecurity Center is dedicated to cybersecurity research, education, and workforce development. The center provides opportunities for collaboration among VCU's cybersecurity programs within the departments of Computer Science and Electrical and Computer Engineering, the Homeland Security and Emergency Preparedness program at the Wilder School of Government and Public Affairs, and the VCU School of Business' Department of Information Systems. It facilitates student and faculty participation in cybersecurity activities such as faculty and industry led talks, a student-run cybersecurity club, cybersecurity competitions,

internships, scholarships, and undergraduate and graduate-level research. The center is also active in community outreach, including Virginia academic and industry initiatives such as the Virginia Cyber Range, the Virginia Cyber Security Partnership (VCSP) and the Commonwealth Cyber Initiative (CCI) Central Virginia Node.

The Department of Computer Science offers a Bachelor of Science in computer science with a concentration in cybersecurity. Students who earn this concentration gain a firm command of cyber defense, cyber forensics, and cyber ethics. They understand and can apply the best practices of computer systems and network security, security architecture, and cryptography. The Cybersecurity Club at VCU qualified for the 2019 National Collegiate Penetration Testing Competition in Rochester, New York.

DESIGNATIONS

• **CAE – Cyber Defense Education**

CONTACT INFORMATION

Dr. Milos Manic
(804) 827-3999
misko@vcu.edu

cybersecurity.vcu.edu

VCU Cybersecurity Team at CPTC Nationals.
(Photo: Mariah Rose Whitmoyer)

VIRGINIA WESTERN COMMUNITY COLLEGE

VWCC STEM Courtyard

Virginia Western Community College (VWCC) is a two-year public institution of higher education located on a 70-acre campus in southwest Roanoke, VA. Established in 1966, VWCC has grown to its current annual enrollment of over 9,000 students in credit courses and more than 1,400 enrollment in fast-track workforce and continuing education courses.

The Center for Cybersecurity Education at VWCC includes new labs designed to provide extra hands-on learning opportunities that prepare students to enter the growing IT Security workforce, as well as to transfer to other colleges and universities and further their education in cybersecurity. Frequent security related events and capture-the-flag competitions are held in the Cybersecurity Center. This open laboratory space invites students to network with peers, educators,

and professionals in the area. It also encourages peer-to-peer interaction on projects and group activities.

VWCC offers an Associate of Applied Science degree in Cyber Security and Network Administration as well as a more focused career studies certificate in Cyber Security that can be completed in one year. Both paths prepare students for industry certifications in security and networking. The curriculum is guided by curriculum advisory committees, which bring together faculty and local industry partners for bi-annual meetings. Students in the programs learn skills such as scripting, secure system administration, ethics, data and privacy law, and project planning.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

B Bagby
bbagby@virginiawestern.edu

virginiawestern.edu/cybersecurity

VWCC Cyber Lab

WALDEN UNIVERSITY

Walden University 2018 Graduation

Walden University was founded in 1970 and is accredited by the Higher Learning Commission (HLC), which accredits degree-granting postsecondary educational institutions in the north central region of the United States. Walden enrolls more than 54,000 students in bachelors, master's, and doctoral degree programs and specialized certifications. The university offers degrees from bachelor's to doctoral level with cybersecurity specializations.

Walden's cyber defense programs have a dedicated online repository, where the university's official Cyber Center of Education has been established. The Cyber Center includes publications, presentations, and cybersecurity related content. The Cyber Center was established prior to Walden's first CAE-CD designation in 2013.

In 2013, Walden established a Doctor of Information Technology (DIT) program. Many doctoral graduates have published dissertation research in the field of cyber defense. Moreover, Walden faculty members have published numerous articles in peer-reviewed journals, such as IEEE and ACM publications, and they have also conducted presentations and participated in nationally recognized security conferences, including CISSE and NICE.

Walden is also committed to collaboration and supporting the business community nationwide, which includes workshops for high-schools, 2-year colleges, and small to medium-size businesses.

DESIGNATIONS

• CAE - Cyber Defense Education

CONTACT INFORMATION

Dr. Bob Duhainy
(617) 510.5538
Bob.duhainy@mail.WaldenU.edu

www.waldenu.edu

Walden University Cyber Student

WALSH

Walsh College, Troy Location (Photo Credit: Justin Maconochie)

Walsh College, in Troy, Michigan, was designated a Center of Academic Excellence in Information Assurance Education in 2003 and was one of the first schools in Michigan to be designated as a Center of Academic Excellence in Cyber Defense. Walsh is a private, nonprofit, upper-division school offering undergraduate, graduate, and doctoral business and technology degrees. Our information technology degrees include concentrations in cybersecurity and the nation's first concentration in automotive cybersecurity. A graduate business certificate in cybersecurity is also offered. Walsh's IT degrees align with the Department of Defense and Department of Homeland Security NICE Framework standards and are F1 DHS STEM designated programs. Walsh has been recognized by thebestschools.org for having one of the best online Master's in Network Security in the country.

Our cybersecurity curriculum follows a technology tradecraft model, combining academic rigor and dozens of hours of hands-on exercises with enterprise-level equipment in our Cyber Lab. This state-of-the-art research and training environment was custom designed to develop highly skilled cybersecurity professionals. Coursework includes automotive threat and malware analysis, securing cyber physical systems, ethical hacking strategies, cryptography, penetration testing, and threat analysis, using current industry tools, programming languages, standards, and protocols. Walsh faculty have decades of industry experience and teach real-world scenarios in small class settings. Students receive personal attention whether a class is online or on ground and graduate with the knowledge, critical thinking, and ethical problem solving skills they need to compete in the constantly evolving field of cybersecurity.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dave Schippers
(248) 823-1369
dschippe@walshcollege.edu

walshcollege.edu

Walsh Cyber Lab

WCTC Campus

WAUKESHA COUNTY TECHNICAL COLLEGE

The vision of **Waukesha County Technical College Center for Cybersecurity Education** is to provide world-class cybersecurity education to future workforce professionals, businesses and institutions. Our objective is to provide a venue for education and research in information assurance, computer network security, digital forensics, cryptography, risk assessment and mitigation, disaster recovery and business continuity management, security regulations and compliance, and information security management.

The WCTC Center for Cybersecurity Education resides within the School of Business located on the main campus of Waukesha County Technical College at 800 Main Street in Pewaukee, Wisconsin.

Waukesha County Technical College was the first college in Wisconsin that has been recognized by the National Security Agency and the Department of Homeland Security as a National Center of Academic Excellence in Information Assurance / Cyber Defense education (CAE-2Y). This designation helps our students as they enter the workforce or transfer to four-year schools, conveying that they graduated from a program nationally recognized for its excellence and alignment to the highest information security standards for two-year college education.

WCTC's cybersecurity programs offer multiple degree and certificate options that lead to the CAE-2Y designation and opportunities to transfer to complete a 4-year bachelor degree. Many student activities extend learning beyond the classroom and enhance professional development.

DESIGNATIONS

• CAE - Cyber Defense 2-Year Education

CONTACT INFORMATION

CyndiKaye Lambach
(262) 691-5242
clambach1@wctc.edu

wctc-cce.org

WCTC Cyber Student

WEBSTER UNIVERSITY

Webster University Campus

Founded in 1915, **Webster University** is a private non-profit university with students at campuses in North America, Europe, Asia, and Africa and with a robust online learning environment. The university is committed to ensuring high-quality learning experiences that transform students for global citizenship and individual excellence. The cybersecurity program resides in the George Herbert Walker School of Business and Technology, Department of Math and Computer Science.

Webster University's Bachelor of Science in Computer Science with an emphasis in cybersecurity is designated as a National Center of Academic Excellence in Cyber Defense, and the Master of Science in Cybersecurity degree is one of the largest programs in the Midwest. Additionally, the program offers two 18-hour cybersecurity certificates - Information Assurance and Threat Detection.

The cybersecurity program at Webster University prepares individuals to lead, manage, and operate the information security programs for communications and computer systems, networks, and IT infrastructures in the public and private sector. As a leading international university, students are able to complete coursework in class, online, via WebNet+, or through a blended mode course of study.

Students are well-versed to apply their knowledge and critical thinking skills related to domestic and international legal systems, public policies, and ethics. They learn how to apply cybersecurity to information protection, threat detection, intelligence/counterintelligence, forensics, social engineering, cloud communications, and space and strategic force operations.

Webster University places special emphasis on supporting women in the cybersecurity discipline by hosting an annual middle school girl's Cyber Explorers Workshop focusing on engaging girls about career opportunities in cybersecurity and computer science.

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Dr. James Curtis
(314) 246-8761
jamescurtis89@webster.edu
webster.edu/business-and-technology/academics/cybersecurity.html

Webster Cyber Students

WESTCHESTER COMMUNITY COLLEGE

WCC Campus

Westchester Community College's Associate of Applied Science (A.A.S.) and certificate programs in cybersecurity provides a strong foundation in computer technology security.

The A.A.S. program covers the functions of hardware, operating systems, databases, and networks. It is designed to cover beginner to advanced topics in areas such as computer forensics, network security, and ethical hacking. This program prepares the student for employment in entry-level positions in information technology, information assurance, security, and digital forensics. The curriculum is for the student who intends to seek full-time employment after graduation, who wishes to make a career change/enhancement into information assurance and information systems, or to transfer into an information technology program at a four-year college.

The cybersecurity certificate provides students with a firm foundation in the basic principles of business security. It is designed for those with prior computer experience and those who need to enhance their job skills. Students may apply the courses towards the A.A.S. degree in cybersecurity. Graduates of the certificate program can expect opportunities to use their expertise in private industry, government, law enforcement, the military, health services, and academia.

DESIGNATIONS

• CAE – Cyber Defense 2-Year Education

CONTACT INFORMATION

John Watkins
(914) 606-8519
John.Watkins@sunywcc.edu

sunywcc.edu/cyber

WCC Cyber Class

WEST VIRGINIA UNIVERSITY

The Advanced Engineering Research (AER) building houses the Lane Department of Computer Science & Electrical Engineering and many of WVU's Cyber programs

West Virginia University has been an active participant in the CAE program since 2006, and currently holds both the CAE-CDE (4 year institution) and CAE-R designations. The primary curriculum program path for the program is through the Lane Department of Computer Science & Electrical Engineering (LCSEE) in the Statler College of Engineering & Mineral Resources. Students may pursue studies in the Cyber field through undergraduate majors in Biometric Systems, Computer Science or Computer Engineering, or through graduate majors in Computer Science. In 2018, we had 38 undergraduates and 52 graduates pursuing studies in this CAE area, including 13 students who completed the BS Biometric Systems degree and 34 students who completed their MS Computer Science degree.

During the past year, WVU has approved two new degree programs focusing on cybersecurity. The Department of Management Information Systems in the Chambers College of Business & Economics will be offering a new MS degree program in Business Cybersecurity, and the LCSEE department will be offering a new BS degree program in Cybersecurity. The BS Cybersecurity degree program has been designed specifically to map the CAE Knowledge Units and the NIST framework. Both degree programs began accepting students in Fall 2018.

WVU has an active research program in the field of cybersecurity, with multiple research projects externally sponsored by the National Science Foundation, the US Department of Justice, and from private industry. Research activities in the fields of biometrics, malware detection, and digital forensics are nationally recognized. WVU Faculty Member Yanfang (Fanny) Ye and her students received the Best Paper Award from the 2017 ACM International Conference on Knowledge Discovery and Data Mining (ACM SIGKDD) for their paper "HinDroid: An Intelligent Android Malware Detection System Based on Structured Heterogeneous Information Network" which demonstrated how machine learning techniques could significantly improve malware detection on Android Devices.

DESIGNATIONS

- **CAE – Cyber Defense Education**
- **CAE – Cyber Defense Research**

CONTACT INFORMATION

Cindy Tanner
(304) 293-9138
cindy.tanner@mail.wvu.edu

lcsee.statler.wvu.edu/cecd

Dr. Yanfang (Fanny) Ye and her students pursue research in using machine learning techniques

Whatcom Campus

Whatcom Community College is a National Center of Academic Excellence in Cyber Defense Education.

Located in Bellingham, WA and serving nearly 11,000 students annually, Whatcom Community College was one of the first community colleges to earn the CAE designation in 2011. According to the Aspen Institute (2016), WCC is rated among the top nine community and technical colleges in the state and recognized as one of the leading community colleges in the nation.

Students at Whatcom choose from a number of paths toward 2- and 4-year degrees in cybersecurity including an associate of science degree, an associate of applied science transfer degree, a bachelor of applied science degree in IT networking-cybersecurity, or highly valued certifications including Cisco CCNA, Comp Tia's A+ and Security+, cloud security, and more.

Enrollment in cybersecurity courses at WCC has consistently increased each year since WCC achieved the CAE designation in 2011, with over 370 students enrolled in 2018-19. Female student participation has also consistently increased, maintaining enrollments at over 55 female students annually since 2016. Most importantly, over 400 WCC students have earned bachelor and/or associate degrees, or focused certificates and certifications in the field, preparing them to enter the workforce and contribute to the continuously growing demand for skilled cybersecurity employees.

DESIGNATIONS

• **CAE - Cyber Defense 2-Year Education**

CONTACT INFORMATION

Corrinne Sande
(360) 383-3552
csande@whatcom.edu

whatcom.edu/cybercenter

Whatcom Lab

WILMINGTON UNIVERSITY

Wilmington University's New Castle Campus is convenient to New York, Philadelphia, Wilmington, and Washington, D.C.

Wilmington University's cybersecurity programs offer affordable, academically rigorous education. The university's Center for Cybersecurity Education consists of bachelor's and master's degree programs, concentrations and certificates in cybersecurity, information assurance, digital forensics, and SCADA. The university and its faculty work with industry, state, and national organizations to further cybersecurity education and help build the nation's ability to defend itself against cyber attacks.

Wilmington University's Bachelor of Science in Computer & Network Security was first designated as a National Center of Academic Excellence in Cyber Defense Education by the National Security Agency and Department of Homeland Security in 2011. The program helps prepare students to sit for industry-recognized certifications, including CISA, CISSP, A+, Linux+, Security +, and Network+.

The Master of Science in Cybersecurity program equips graduates to battle cyberterrorism and protect against multivector cyber attacks in a content-rich program addressing cyber intelligence, cybercrime investigative principles, forensics, preservation of critical infrastructures, counter sabotage, and espionage. The program also teaches threat modeling and analysis, constructing defense scenarios, and guarding against asymmetric warfare and attack.

Certificate programs allow professionals to quickly expand their skills and credentials in targeted areas such as SCADA and cyber terrorism.

All cybersecurity programs at the University stay agile and responsive to rapidly changing industry needs. The programs are designed to allow students to immediately begin applying the knowledge and skills gained from courses to the workplace. The programs are available online, maximizing flexibility for busy students

DESIGNATIONS

• CAE – Cyber Defense Education

CONTACT INFORMATION

Mark J. Hufe, Ed.D
(302) 356-6869
mark.j.hufe@wilmu.edu

wilmu.edu/cce

Wilmington University students learn skills that are immediately applicable on the job.

WORCESTER POLYTECHNIC INSTITUTE

WPI Campus

Worcester Polytechnic Institute's (WPI) cybersecurity programs prepare students to be effective leaders in a world where actual and potential digital cyberattacks and security threats can disrupt entire industries. With the skills to keep systems secure and the drive to remain a step ahead, WPI's cyber students are committed to making the world safer.

Multidisciplinary teams work within four distinct research areas: Analysis, Architecture, Principles, and Security Mechanisms/Functionality. They tackle subjects as varied as cryptography and cloud computing to forensics and authentication, so students learn to approach challenges from several angles and in team settings.

Students are involved in all aspects of cybersecurity from the beginning of their studies and may apply for the National Science Foundation's CyberCorps® Scholarship for Service initiative. WPI's undergraduate curriculum allows for exploring and developing preemptive measures, comprehensive solutions, and ongoing safeguards.

Graduate students may choose between an industry-focused non-thesis track or a research-intensive thesis track program. Either choice allows for independent study and research under the guidance of an engaged advisor. Graduates are sought after for jobs in academia, industry, and government. WPI's cybersecurity program supports real-world impact in a field where employees are in high demand.

DESIGNATIONS

• CAE - Cyber Defense Research

CONTACT INFORMATION

Craig Shue
(508) 831-4933
cybersecurity@wpi.edu

wpi.edu/academics/departments/cybersecurity

WPI's project-based curriculum provides students with hands-on experience

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