

# **Addressing the Cybersecurity Workforce Shortage through Upskilling and Reskilling:**

## **Best Practices, Educator, Employer, and Learner Perspectives**

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# Moderator and Panelists



**Dr. Eman El-Sheikh**

Associate Vice President  
and Professor

University of West Florida  
Center for Cybersecurity

**Dr. Faisal Kaleen**

Professor  
Metro State University

**Erin Weiss Kaya**

Senior Strategist for  
Innovation Group  
Booz Allen Hamilton

**Justin Rhoads**

Sr. Field Operations  
Engineer  
Dragos

# Upskilling and Reskilling Best Practices: National Cybersecurity Workforce Development Program

- [cyberskills2work.org](https://cyberskills2work.org)
- Funded by a \$9 million 3-year NSA NCAE-C grant
- Led by the University of West Florida
- Develop nationally sustainable and scalable workforce program
- Prepare transitioning military, veterans, and first responders for cybersecurity jobs
- Provide free training, career development, and certifications
- Place in Critical Infrastructure sectors: Financial Services, Defense Industrial Base, and Energy
- Train and place over 1700 students across the country over 3 years

The CAE-C Coalition includes:

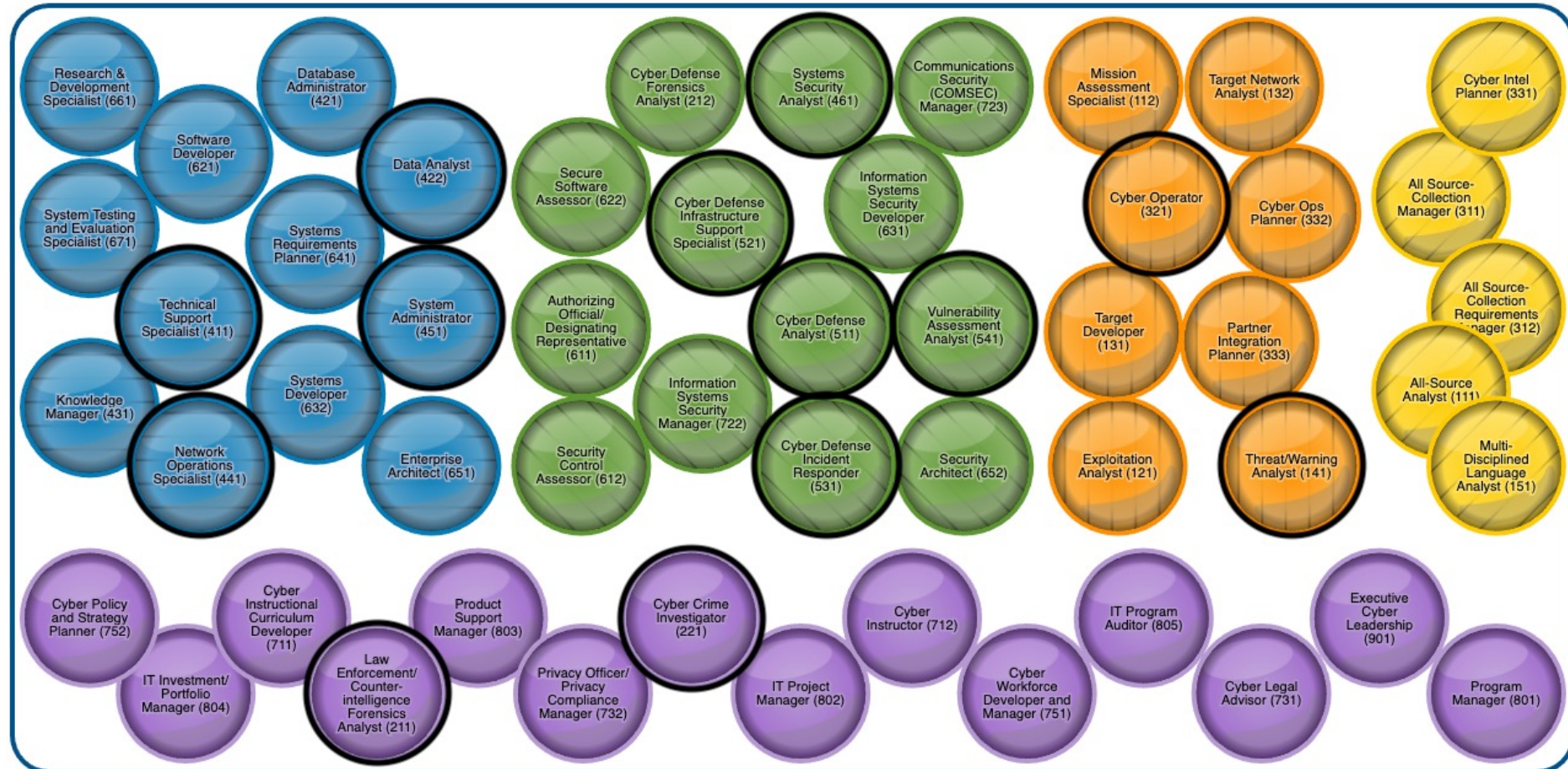
- Augusta University
- Dakota State University
- Eastern New Mexico University - Ruidoso
- Florida International University
- Metropolitan State University
- San Antonio College
- University of Houston
- University of South Florida – Cyber Florida
- University of Texas at San Antonio



# Best Practices: NICE Work Role-Based Upskilling and Reskilling

15 NICE Work Roles Addressed:

- Cyber Crime Investigator
- Cyber Defense Analyst
- Cyber Defense Incident Responder
- Cyber Defense Infrastructure Support Specialist
- Cyber Operator
- Data Analyst
- Law Enforcement / Counterintelligence Forensics Analyst
- Malware Analyst
- Network Operations Specialist
- System Administrator
- System Security Analyst
- Technical Support Specialist
- Threat/Warning Analyst
- Vulnerability Assessment Analyst

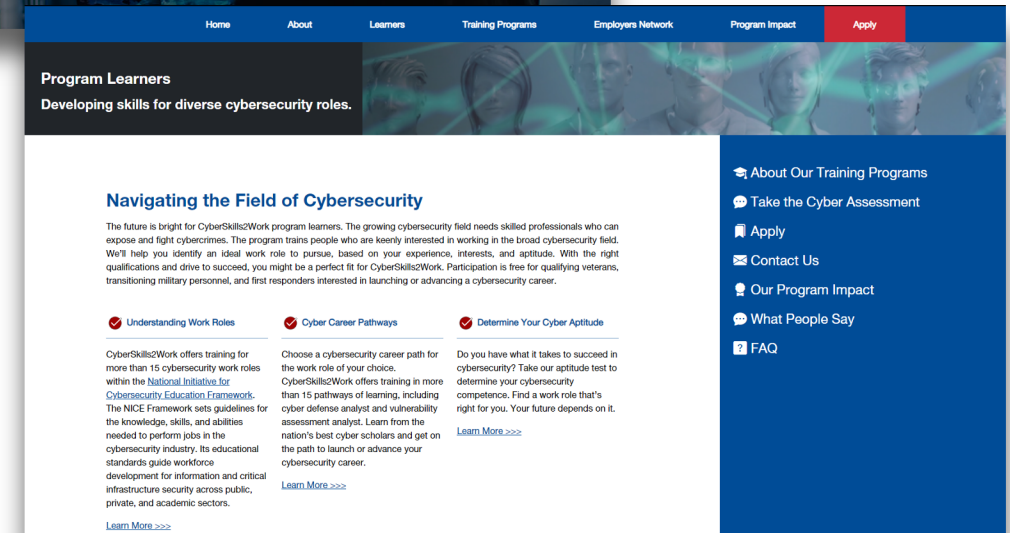


# How can Upskilling and Reskilling Programs Address Workforce Shortages?

- **Successful delivery of a reskilling program is most impactful when part of a holistic talent solution aligned to the most in-demand positions.** Consider the full human capital lifecycle. Look at which cyber positions are most in-demand regionally, assess if these are entry-level or experienced, and align programs to these so participants are able to more quickly apply skills to fill high-demand needs.
- **Focus on building relationships with Hiring Managers early – whether internal to your organization or external partnerships with outside employers.** Early relationships with potential hiring teams and engaging with them often helps ensure post-program employment success.
- **Consider piloting your program with candidates most likely to succeed while building in greater diversity of participants by using alternatives measures – like an aptitude assessments.** Filtering applicants through a multi-step process of an aptitude assessment that can predict year one performance aligned to targeted roles then an interview – using assessments such as a situational judgement test and/or behavioral interviews – will lead to stronger, more diverse cohort selection and greater long-term outcomes.
- **The career path into cyber roles is broad - help demystify cyber language.** Strengthen the likelihood of employment of your candidates by using the shared understanding provided by the NICE Framework roles and bring representatives from those roles into your program.

# Upskilling and Reskilling Resources: CyberSkills2Work.org Website

- Serves as a one-stop-shop for learners, employers, NCAE-C institutions & stakeholders
- Learners can
  - Take aptitude assessment to identify recommended NICE work roles
  - Search and apply to all training pathways offered by NCAE-C Coalition
  - Connect with resources, employers & job opportunities
- Employers, NCAE-C institutions & stakeholders can
  - Review program, pathway, learner, or employer data via dynamic dashboards
  - Generate reports



# Upskilling and Reskilling Resources: CyberSkills2Work Curriculum

All curriculum and resources will be shared with the NCAE-C Community via the NCAE-C Resources Directory and CLARK

28 training pathways offered

108 unique courses developed and offered by Coalition



National Cybersecurity Workforce Development Program

## Sample courses developed and offered:

- Introduction to Defensive Cyber Operations
- Cyber Network Defense and Countermeasures
- Malware Analysis Fundamentals
- OSINT Analyst
- Computer and Network Security Fundamentals
- Foundations of Global Cybersecurity Policy
- Networking Forensics and Incident Response
- CompTIA Network+ Course and Exam Prep
- CompTIA Security+ Course and Exam Prep
- Computer System Forensics
- Firewalls and Network Security
- Cyber Defense Fundamentals
- Networking Fundamentals
- Cyber Security Principles
- Careers in Cyber Security
- Threat Intelligence
- Industrial Control Systems Security
- Ethical Hacking, Computer & Network Defense & Counter Measures

**Who are we?** Booz Allen is one of the largest providers of cybersecurity and managed security services for the federal government, and we've gone through our own journey to recruit, develop, and retain internal cyber talent which we apply to our client engagements.

**Our proprietary internal upskilling program**, Cyber Technical Excellence Program, addresses future foundational, intermediate, and advanced learning needs.

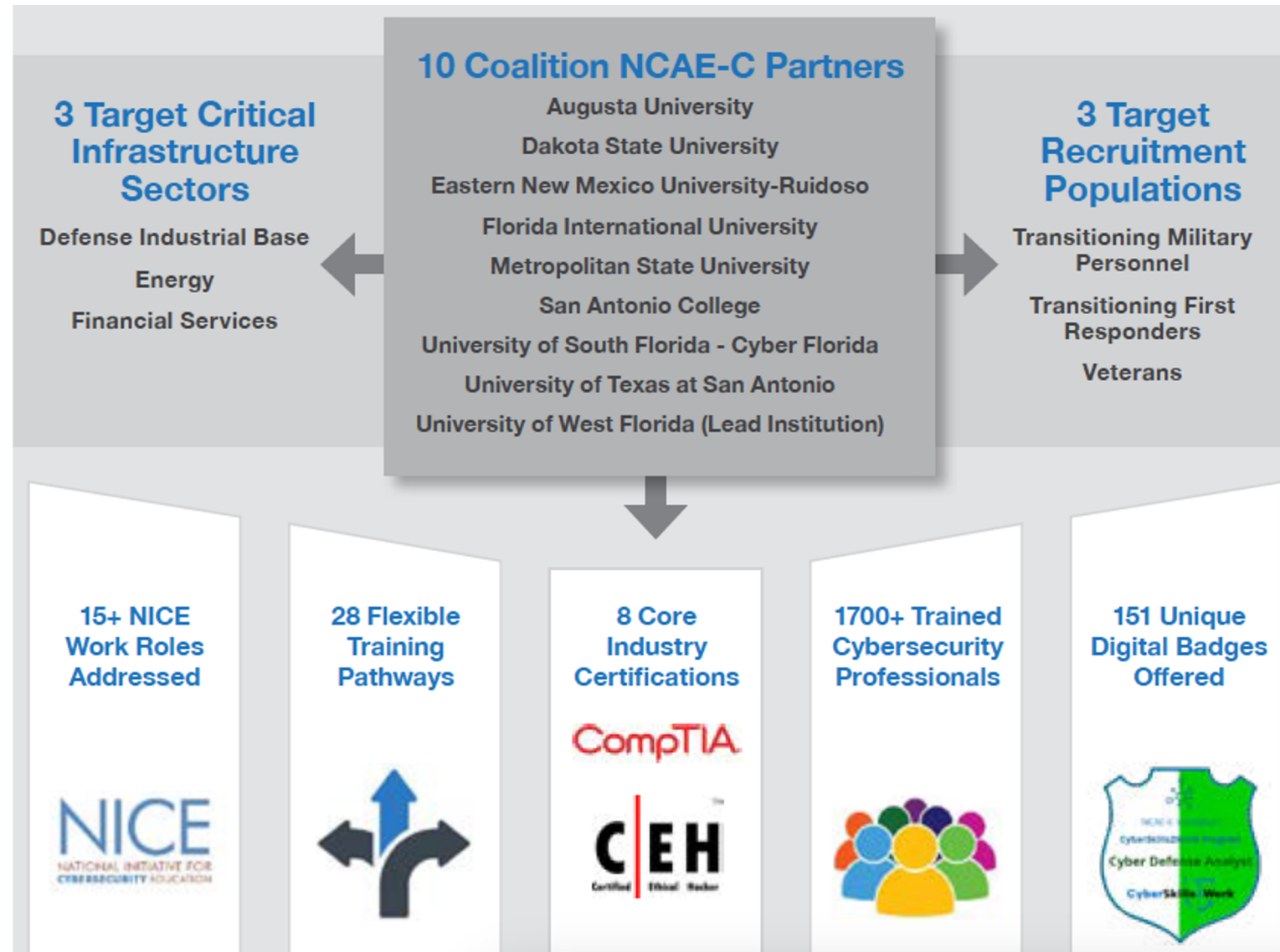
- **The intensive, structured program focuses on cyber defense roles** – NICE's Cyber Defense Incident Responder (531), Cyber Defense Analyst (511) and Threat/Warning Analyst (141).
- **Five key components:** (1) aptitude and skills assessments, (2) in-person and online training, (3) networking with subject matter experts, (4) remote-based mentoring, and (5) capstone activity.
- **A 14-week program.** Combines Cyber Essentials / Core (4 wks) followed by Cyber Defensive / Intermediate (10 wks). Participants have little to no cyber knowledge and test into the program based on aptitude only.
- **Mix-modality virtual training of geographically dispersed employees** includes a mix of virtual classroom and self-paced learning as well as hands-on keyboard learning through Labs and Capture the Flag competitions.
- **Participants obtain one of the DoD Approved 8570 baseline certifications** upon completion of the program
- **Demonstration of a significant score increase on validated skill assessments** from pre- to post- testing of program.



# Best Practices for Building a Holistic and Successful Reskilling Program

- **Stand-alone training curriculums are only one element of the most effective reskilling programs.**
  - **Include mixed-modality elements to support progressive learning and better support post-reskilling knowledge retention.** First participants gain new skills then experientially apply skills in advanced realistic scenarios. Introducing a combination of virtual instructor-led learning, self-paced learning, hands-on keyboard learning through laboratory simulations, and gamification experiences a modern talent experience.
  - Use a **continuous feedback loop** between participants and the instructors through regular surveys, allowing for correction to help maximize experience, engagement, and learning throughout the training along.
  - Consider designing and using **validated simulation-based skill assessments**, which measure demonstrated cyber technical and non-technical skills critical for successful job performance at multiple career levels, from entry-level to experienced professionals.
  - Think about setting level-based **proficiency standards or targets**. Proficiency standards/targets from in-program assessment data allow identifications of individual skills gaps, prioritize trainings and assess training effectiveness for rapid, continuous improvement.
- **Cyber concepts can be taught by those without cyber expertise; however, applying and evaluating cyber skills requires a reskilling program that includes real cyber experts.** A fundamental piece to helping participants excel is looking at what students did, discussing why they did it that way, and offering practical critiques on student approaches – providing the valuable feedback only a cyber expert can offer.

# How Does the CyberSkills2Work Program Help Individuals and Organizations?



# Upskilling and Reskills Programs: Get Involved with the National Cybersecurity Workforce Development Program



## CALL TO ACTION



# Thank you!



**Dr. Eman El-Sheikh**  
Associate Vice President  
and Professor  
University of West Florida  
Center for Cybersecurity  
[eelsheikh@uwf.edu](mailto:eelsheikh@uwf.edu)

**Dr. Faisal Kaleen**  
Professor  
Metro State University  
[Faisal.Kaleem@metrostate.edu](mailto:Faisal.Kaleem@metrostate.edu)

**Erin Weiss Kaya**  
Senior Strategist for  
Innovation Group  
Booz Allen Hamilton  
[Weiss\\_Kaya\\_Erin@bah.com](mailto:Weiss_Kaya_Erin@bah.com)

**Justin Rhoads**  
Sr. Field Operations  
Engineer  
Dragos  
[jdrhoads@gmail.com](mailto:jdrhoads@gmail.com)