

NICE | Conference and Expo 2022

JUNE 6 - 8, 2022 | WESTIN PEACHTREE PLAZA | ATLANTA, GA

DEMYSTIFYING CYBERSECURITY

Integrated Approaches to
Developing Career Pathways

FIU | FLORIDA
INTERNATIONAL
UNIVERSITY

 **NEW
AMERICA**

Using the Apprenticeship Model to Develop Cyber Talent

James Rodriguez

Assistant Secretary, Veterans' Employment and Training Service (VETS)

U.S. Department of Labor

Kimberly Hauge

Program Analyst, Office of Apprenticeship

U.S. Department of Labor

Carolyn Renick

Apprenticeship, Licensing and Credentialing Lead, Veterans' Employment and Training Service (VETS)

U.S. Department of Labor

Jarrod D. Benjamin

Cybersecurity Apprenticeship Program Director

Florida International University



U.S. DEPARTMENT OF LABOR

Using the Apprenticeship Model to Develop Cyber Talent

NICE Conference 2022
Breakout Session 3
Wednesday, June 8
10:15-11:00 am



U.S. DEPARTMENT OF LABOR

Speakers

- **Carolyn Renick**, Apprenticeship, Licensing and Credentialing Lead
U.S. Department of Labor, Veterans' Employment and Training Service
 - **James Rodriguez**, Assistant Secretary
U.S. Department of Labor, Veterans' Employment and Training Service
 - **Kimberly Hauge**, Program Analyst
U.S. Department of Labor, Office of Apprenticeship
 - **Jarrod Benjamin**, Cybersecurity Apprenticeship Program Director
Florida International University
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U.S. DEPARTMENT OF LABOR

Agenda

- Learn about the U.S. DOL and the Veterans' Employment and Training Service's efforts to support and expand Registered Apprenticeship
 - Updates from the U.S. Department of Labor, Office of Apprenticeship
 - Overview of Florida International University's Cybersecurity Apprenticeship Program
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U.S. DEPARTMENT OF LABOR



Veterans' Employment and Training Service



Assistant Secretary
James D. Rodriguez

Enabling all veterans, transitioning service members and military spouses to reach their full potential in the workplace



U.S.DOL Office of Apprenticeship Resources

Wed, June 8, 2022

Kimberly Hauge, Program Analyst, Office of Apprenticeship

Hauge.Kimberly@dol.gov

www.apprenticeship.gov

A Proven Workforce Solution

Registered Apprenticeship is an **industry-driven, high-quality** career pathway where employers can **develop** and prepare their **future workforce**, and individuals can obtain **paid work** experience, **classroom instruction**, and a portable, **nationally-recognized credential**.

Five Components of Registered Apprenticeship



Registered Apprenticeships are jobs



On-the-job learning in a work setting



Job-related classroom training



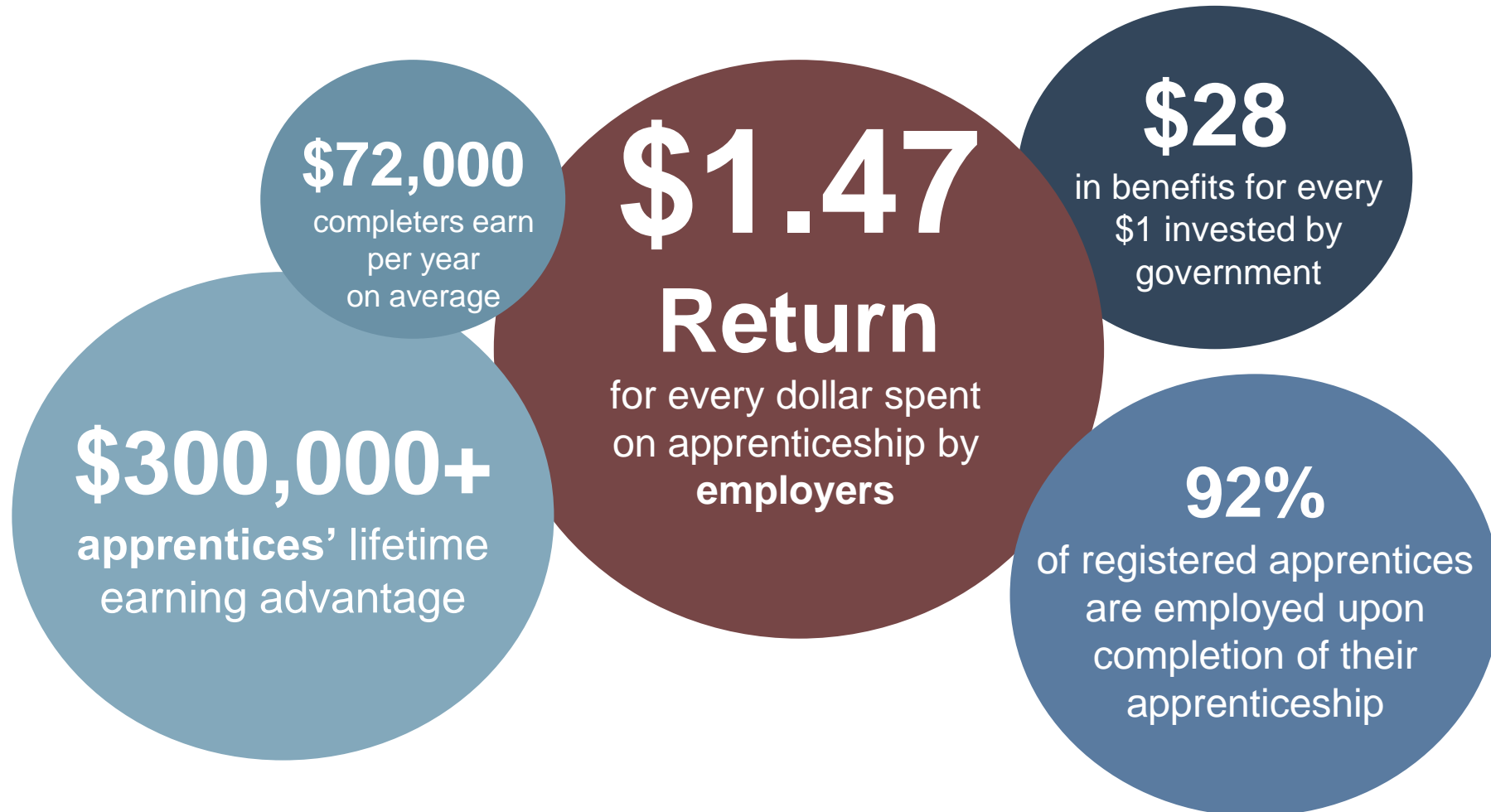
Learning with the help of a mentor



Industry-recognized credential

Registered Apprenticeship Has a Proven Track Record of Producing Strong Results for Employers and Workers

Impressive Individual – Employee – Public Return on Investment



APPRENTICESHIP CONTINUES TO DEMONSTRATE STRONG GROWTH

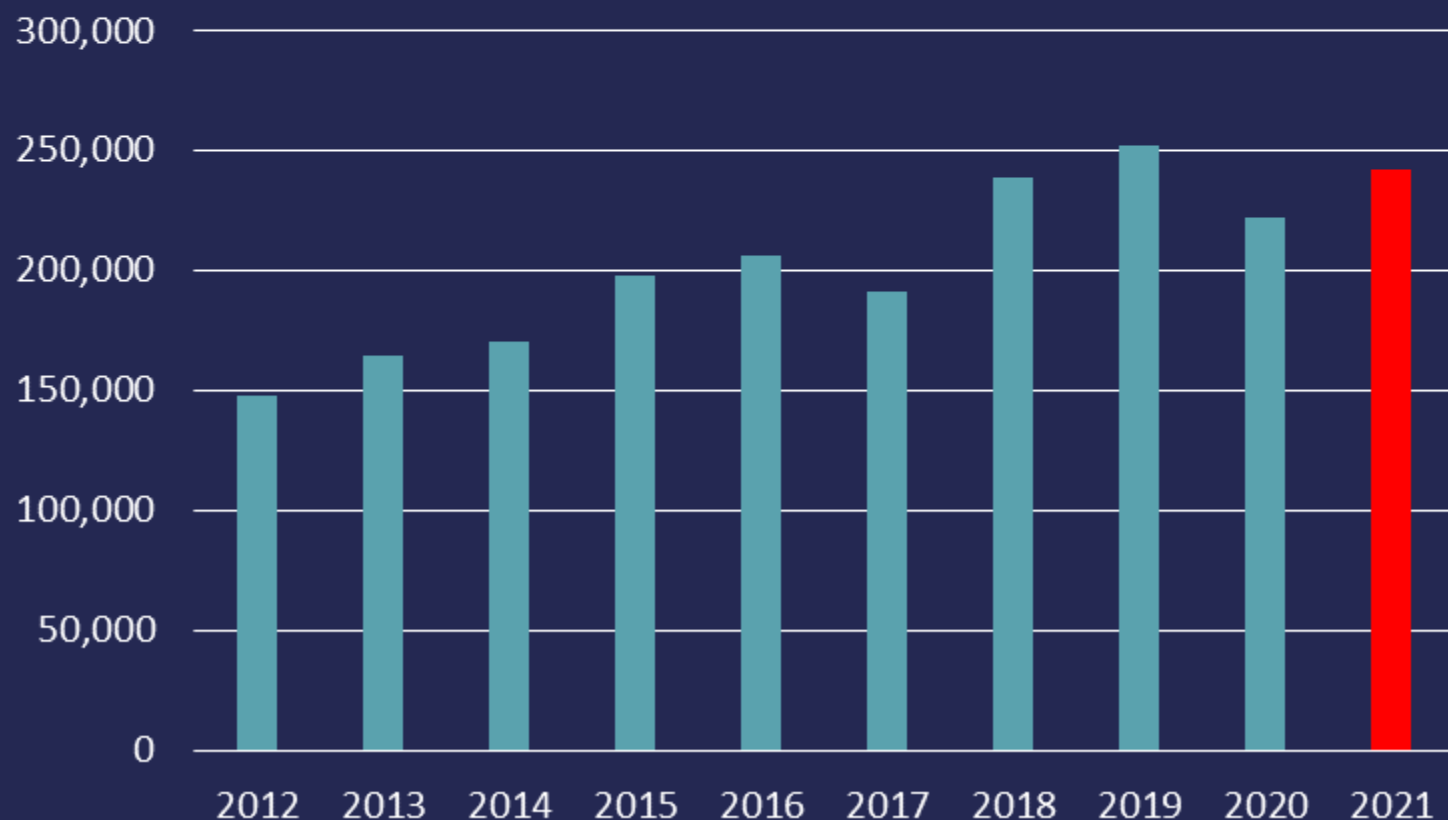
64%

Growth in New Apprentices Since 2012

Key Facts

- 2 million+ new apprentices since FY12
- 22% more active apprentices than the previous 10-year average (593,000 vs. 484,000)
- 396,000+ participants completed an apprenticeship in the last five years
- 14,700+ new apprenticeship programs created in last five years

Annual New Apprentices



A Diverse Range of Industries



Healthcare



Cybersecurity



Information
Technology



Biotechnology



Transportation



Construction



Financial
Services



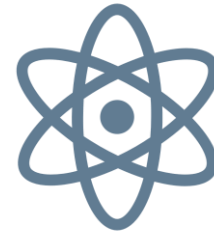
Advanced
Manufacturing



Hospitality



Engineering



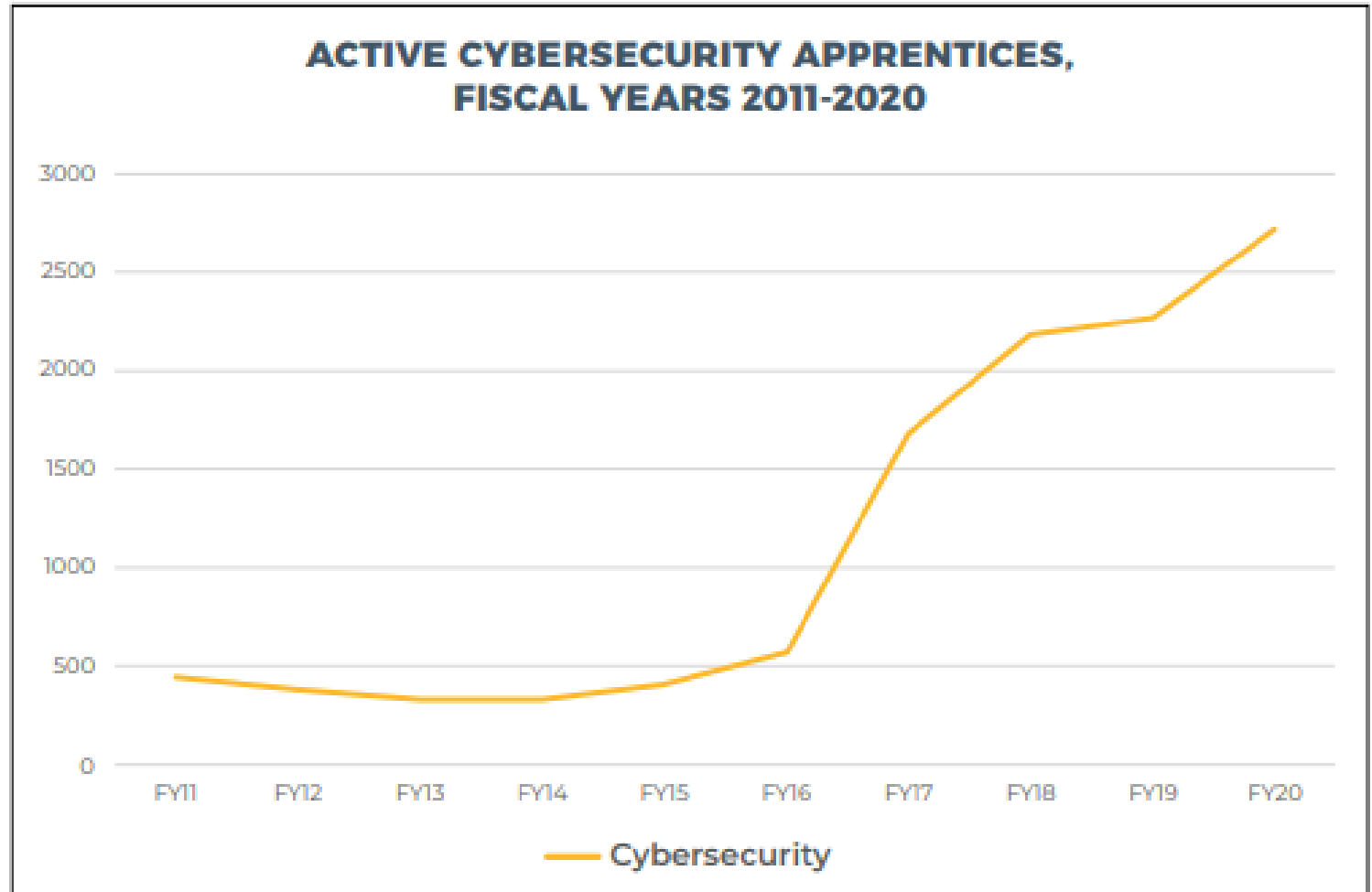
Energy



Telecommunications

Cybersecurity Apprenticeship Programs

- As of April 1, 2022:
 - Almost 3K active apprentices
 - Over 600 active programs
- Strong growth



Cybersecurity Apprenticeship Program Sponsors

 Microsoft	 BOSCH	 Alaska Primary Care ASSOCIATION	JPMORGAN CHASE & CO.
 BlueCross BlueShield of South Carolina	 Postmates	 WELLS FARGO	 BOEING
 LOCKHEED MARTIN	 S smoothstack	 T-Mobile®	 IBM®
 twilio	 P PURDUE UNIVERSITY®	 amazon	 ARMY NATIONAL GUARD

Benefits of Registering Your Program



Register

Take advantage of benefits such as funding opportunities, tax credits, and no-cost technical assistance when you register your program.

By registering your program with the U.S. Department of Labor or State Apprenticeship Agency, you will gain access to additional resources:



Access to a nationwide network of expertise, customer service, and support at no charge.



Access funding and other resources from federal programs. In many states, businesses can qualify for tax credits.



Graduates receive an industry-recognized and nationally-portable credential

Benefits for Employers

- ▶ Create a diverse and highly-skilled workforce
- ▶ Improve productivity and profitability
- ▶ Increase staff loyalty and retention of workers
- ▶ Flexible training options
- ▶ Minimize liability costs
- ▶ Access to federal and state resources
- ▶ Receive tax credits and employee tuition benefits

Want more info? Visit the [Employer page on Apprenticeship.gov](https://www.apprenticeship.gov/employer)



Benefits for Career Seekers

- ▶ Earn as you learn
- ▶ Avoid student debt
- ▶ Gain workplace-relevant skills in the field of their choice
- ▶ Ease the transition from school to career
- ▶ Receive an industry-recognized and nationally-portable credential and/or college credits
- ▶ Jump start your career

Want more info? Check out the [Career Seeker page on Apprenticeship.gov](https://www.apprenticeship.gov/career-seeker).



Benefits for Educators



- ▶ Creates a revenue stream
- ▶ Fulfill mission
- ▶ Increase enrollment and number of completers
- ▶ Provide students hands-on learning opportunities
- ▶ Stronger connection to employers
- ▶ State and tax credits may apply via WIOA and, possibly, FASFA

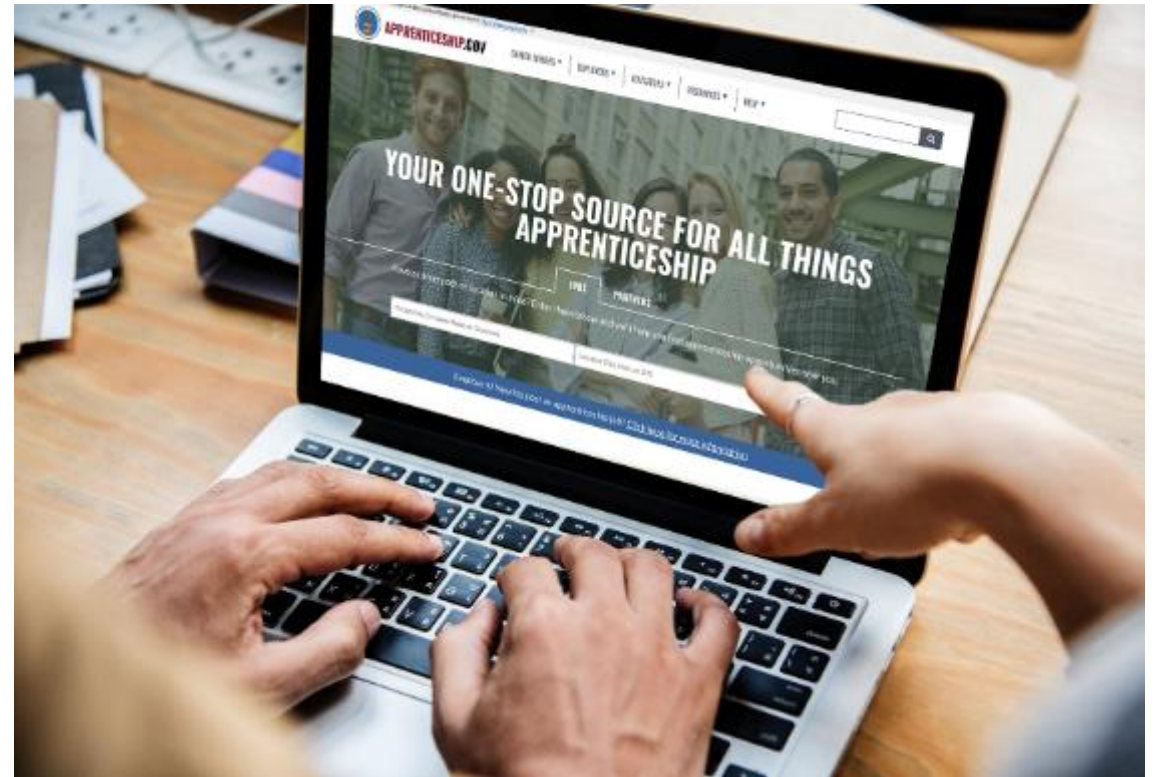
Want more info? Visit the [Educator page on Apprenticeship.gov](https://www.apprenticeship.gov/educator)



Resources to Help You Explore Apprenticeship and Design a Program

Apprenticeship.gov Overview

- Occupation Finder
- Partner Finder
- Standards Builder
- Equal Employment Opportunity
- Resource Hub
- Investments, Tax Credits, and Tuition Support



Industry Intermediaries

Contractor	Industry
Appteon Inc.	Information Technology (IT)
Arbor E&T	Healthcare, Health IT
Cybersecurity Youth Apprenticeship Initiative (CYAI)	Cybersecurity (youth programs)
Maher & Maher	Information Technology (IT)
Safal Partners	Cybersecurity
Washington Technology Industry Associations (WTIA)	Information Technology (IT)

Apprenticeship Investments (Active)

- **Apprenticeship Building America (ABA) Grant Program** (\$113 million)
- **Expansion of Registered Apprenticeship Programs through Industry Intermediary Services** (\$8 million)
- **2021 Women in Apprenticeship in Nontraditional Occupations (WANTO) Technical Assistance (TA) Grant Program** (\$3.3 million)
- **State Apprenticeship Expansion, Equity, and Innovation Grants** (Over \$99 million)
- **H-1B Rural Healthcare Grant Program** (\$40 million)
- **H1-B One Workforce Grant Program** (\$150 million)
- **Registered Apprenticeship Technical Assistance Centers of Excellence** (\$31 million)
- **2020 WANTO Technical Assistance TA Grant Program** (\$4.1 million)
- **Industry and Equity Intermediary Contracts** (\$22 million)
- **2020 State Apprenticeship Expansion Grants** (\$81 million)
- **Youth Apprenticeship Readiness Grants** (\$42.2 million)
- **Apprenticeship: Closing the Skills Gap Grants** (\$100 million)
- **Apprenticeship State Expansion Grants** (\$73 million)
- **Youth Apprenticeship Intermediary Contracts** (\$7.7million)
- **Scaling Apprenticeship Through Sector-Based Strategies Grants** (\$183.8 million)
- **Apprenticeship Expansion and Modernization Fund** (\$24 million)
- **Expanding Community College Apprenticeship with American Association of Community Colleges** (\$20 million)

Visit <https://www.apprenticeship.gov/open-funding-opportunities> for more information.

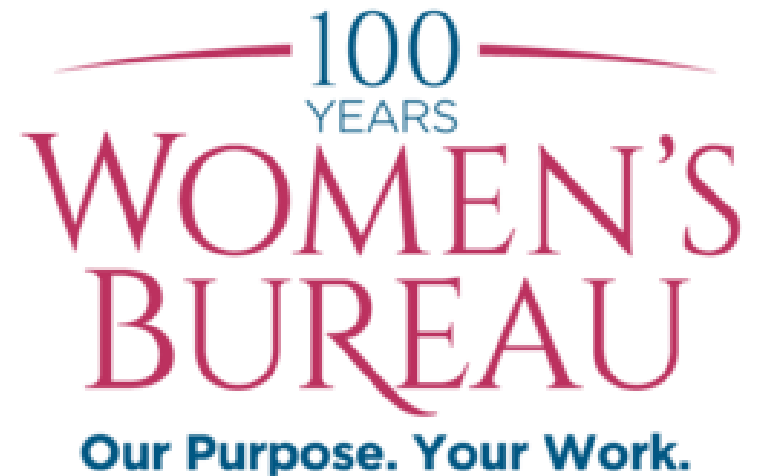
U.S. DOL – Women's Bureau

Mission: Women in the workforce are vital to the nation's economic security. The Women's Bureau develops policies and standards and conducts inquiries to safeguard the interests of working women; to advocate for their equality and economic security for themselves and their families; and to promote quality work environments.

Apprenticeship Resources:

- [2022 Women in Apprenticeship in Nontraditional Occupations \(WANTO\) Technical Assistance \(TA\) Grant Program](#) (\$3.4 million)
- [Women in Tech Software Engineering Apprenticeship](#)
- [Bearing the Cost: How Overrepresentation in Undervalued Jobs Disadvantaged Women during the Pandemic](#)

For more information, visit www.dol.gov/agencies/wb



U.S. DOL – Office of Disability Employment Policy (ODEP)

Mission: To develop and influence policies and practices that increase the number and quality of employment opportunities for people with disabilities.

Apprenticeship Resources:

- [PEAT: Partnership on Employment & Accessibility Technology](#)
- [Partnership on Inclusive Apprenticeship \(PIA\)](#)


For more information, visit www.dol.gov/agencies/odep

Not Sure Where to Begin? Express Your Interest and We'll Help You Get Started

Answer a few simple questions and we'll connect you to an apprenticeship consultant to help you get started.

Visit

www.apprenticeship.gov/employers/express-interest



The screenshot shows the website interface for 'APPRENTICESHIP.GOV'. The navigation bar includes links for 'CAREER SEEKERS*', 'EMPLOYERS*', 'EDUCATORS*', 'RESOURCES*', and 'HELP'. A search icon is visible in the top right. Below the navigation, a breadcrumb trail reads 'HOME / EMPLOYERS / EXPRESS INTEREST INSTRUCTIONS'. The main content area features a large image of four people in an office setting. A dark blue banner with the text 'EXPRESS INTEREST' is overlaid on the image. Below the image, the heading 'If you're an Employer' is followed by the text: 'Click GET STARTED if you are an employer or organization interested in creating your own or joining an existing apprenticeship program'. Below this, it says 'Express your interest in starting a program' and a teal button labeled 'GET STARTED!' is displayed.

List of Resources and Links

- Community Colleges in apprenticeship: www.apprenticeship.gov/educators/community-colleges
- Diversity, equity, inclusion, and accessibility in apprenticeship: www.apprenticeship.gov/employers/diversity-equity-inclusion-accessibility
- Partner Finder: www.apprenticeship.gov/partner-finder
- Apprenticeship Finder: www.apprenticeship.gov/apprenticeship-job-finder
- Universal Outreach Tool: www.apprenticeship.gov/eoo/sponsors/recruit-and-hire/universal-outreach-tool
- Investments, tax credits, and tuition support: www.apprenticeship.gov/investments-tax-credits-and-tuition-support
- Express Interest: www.apprenticeship.gov/employers/express-interest

Thank You for Joining Us Today

Let's continue to explore ideas to grow apprenticeship

Any Questions? The Office of Apprenticeship is here to help!

www.apprenticeship.gov

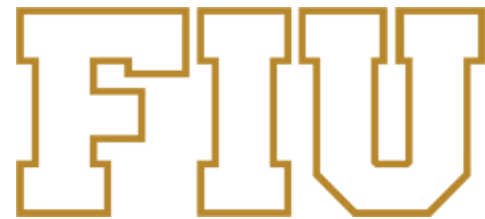
Kimberly Hauge: hauge.Kimberly@dol.gov

The logo consists of the letters 'FIU' in a bold, blocky, outlined font. The letters are white with a dark blue outline. The background behind the logo is a dark blue rectangle with a yellow and cyan gradient border on its right and bottom edges.

FIU

FIU Cyber-CAP

Cybersecurity Apprenticeship Program

The logo consists of the letters 'FIU' in a bold, blocky, outlined font. The letters are white with a dark blue outline. The background behind the logo is a white rectangle with a yellow and cyan gradient border on its bottom and right edges.

FIU

FLORIDA INTERNATIONAL UNIVERSITY



Florida International University is Miami's public research university, centered around real students with real goals and responsibilities, rooted in the realities of the world today.

As an ever-evolving top-50 public research university, we are approaching education in a new way on our own terms—making a real difference along the way.

- Jarrod Benjamin, FIU Cyber-CAP Director
- Monica Uraga, FIU Cyber-CAP Program Coordinator



Hallmarks of Apprenticeship

1. Paid, work-based component
2. On-the-Job Training (OJT) and mentorship
3. Educational and instructional component
4. Industry-recognized credentials earned
5. Safety, supervision, and equal employment opportunity





FIU Cybersecurity Apprenticeship Program (FIU Cyber-CAP)

- The program is an “earn while you learn” pathway, where employees work with their supervisors to learn on-the-job skills while receiving related training from FIU.
- FIU is open to partnering with employers from all industries to identify which credentials are the best fit for your work environment.

FIU Cybersecurity Apprenticeship Program (FIU Cyber-CAP)



FIU provides:

- Instruction to ensure apprentices obtain relevant cybersecurity knowledge.
- A pathway for apprentices to earn industry-recognized credentials.
- A flexible training plan that can be customized to meet business needs.

FIU works with employers to:

- Develop a customized pathway for new hires, incumbent workers, or interns.
- Align instruction and industry-recognized credentials to on-the-job training.



Contact Us!

FIU Cyber-CAP Email:
cybercap@fiu.edu

FIU



THANK YOU!

- DOL VETS: Carolyn Renick, Renick.Carolyn.G@dol.gov
- DOL Office of Apprenticeship: Kimberly Hauge, Hauge.Kimberly@dol.gov
- FIU: Jarrod Benjamin, jbenjami@fiu.edu

Follow VETS on LinkedIn and Twitter

Twitter: https://twitter.com/VETS_DOL LinkedIn: www.linkedin.com/showcase/dolvets

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From the Classroom to the Cyber Ops Center: Collegiate Workforce Development through Hands-on Application

Stephanie Travis

Director, Senior Military College Cyber Institute
Virginia Tech



NATIONAL SECURITY INSTITUTE
VIRGINIA TECH.

From the Classroom to the Cyber Ops Center: Collegiate Workforce Development through Hands-on Application

Stephanie Travis
Director, Senior Military College Cyber Institute
Intelligent Systems Division

- Program Motivation
- Program Outline and Key Points
- Lessons Learned

- Two Workforce Development Programs
 - Raytheon Technologies and Department of Defense (Senior Military College Cyber Institute)
- Slightly different program goals but same baseline academic requirements
 - Raytheon – research focused
 - DoD – Cyber Mission Force and DoD CIO work roles
- Complimentary materials to degree coursework
 - Bridge the gap between academics and application
 - Level set multiple degree tracks to a single set of skills while embracing a cross-disciplinary approach to cybersecurity



Raytheon Fellowship

- Year 1 (Sophomores)
 - Academics
- Year 2 (Juniors)
 - Research Projects
 - Red Team Exercise
- Year 3 (Seniors)
 - Research Projects Continued
 - SOC Incident Response Exercise

DoD Fellowship

- Year 1 (Sophomores)
 - Academics
- Year 2 (Juniors)
 - University IT Security Rotations
 - Red Team Exercise
- Year 3 (Seniors)
 - Research Projects
 - SOC Incident Response Exercise

Program Key Points - Academics

Key Topics

- Introduction to Computers
 - Operating Systems, Hardware, Virtualization
- Networking
- Principles of Cybersecurity
 - Vulnerabilities, Security Appliances, Network Traffic Analysis
- Introduction to Hacking
 - Ethics, Hacking Methodologies, Vulnerabilities and Network Scanning, Metasploit
- Programming and Scripting
 - Python and Bash
- Cryptography
 - Symmetric and Asymmetric cryptography, PKI
- Introduction to Machine Learning

3 Iterations - Lessons Learned

- Scaled back some of the academics to maintain students in the cohort
 - Interview in freshman year, sophomore year is a stark increase in academic requirements
- More labs keep the students more engaged but do not always reinforce the principles of the material
- Networking consistently takes longer than allotted

Program Key Points – Research Projects

- Small teams focused on sponsored research
 - Raytheon or DoD-based projects
- Reinforces the challenges in cybersecurity and expands critical thinking and problem-solving skills
- Focused on applied research and connecting the students to understanding the problem they are solving that will translate into their future career

Program Key Points - Exercises

Red Team Exercise

- Weeklong series building initial access to creating effects on the network
- Planning from a provided objective to meet goals – moving beyond a CTF style event
- 3-5 person teams

SOC Incident Response

- Three-day series building from initial detection to incident clean up including leadership briefing requirements
- Students will fill multiple SOC roles over the course of the three days
- Build on teamwork and technical skills to understand that cyber is a team sport
- One single team across both cohorts

- 10 hours a week “internship”
- Rotate through two teams based on student interest
 - Network security
 - Blue team
 - Web red team
 - Incident response
- Learn policy and security monitoring skills as part of an active security operations team

- Providing students multiple opportunities to try on different roles is essential
 - Cyber has so many different work roles that the students often feel lost
 - Giving them the opportunity to “try on” the work roles helps them to narrow down future goals
- Program flexibility and support is key to sophomore year retention
 - Highest attrition rate is sophomore year
 - Program is not degree granting – keeping students communicating is key to engagement and success
- The foundational stuff is boring – bring in the stories to keep it exciting
 - Even labs don’t help to make some of the early foundational material more engaging
 - Tie the material to experiences of why it matters and how it is used in the workforce – tell “war stories” of where the material gets used to connect why the information is being taught

- Smaller group research teams are more successful, but they require significantly more faculty support
- At least one faculty member needs to “grow” with the students through their path so they always have a safe and familiar touch point through the three years
- Bringing in a GTA to support year 1 office hours and homework review ensured timely and consistent feedback
 - Year 1 is team taught by a team of 3 faculty members

**Contact Information:
Stephanie Travis
stephanietravis@vt.edu**



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VIRGINIA TECH.

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Networking Breakout: Modernize Talent Management

Lynsey Caldwell

Cyber Strategic Workforce Planning Director
Leidos

Peter Meehan

SVP International iQ4 Corp and Co-Founder Cybersecurity
Workforce Alliance (CWA)
iQ4 Corp

NICE

NATIONAL INITIATIVE FOR **CYBERSECURITY** EDUCATION



National Initiative for Cybersecurity Education

Modernize Talent Management Working Group

8th June 2022

Welcome to the Modernize Talent Management Working Group!

Co-Chairs:

Lynsey Caldwell – Leidos
Kevin Perry – US Army
Melissa Woo – Michigan State University

Working Group Charter:

Focuses on NICE Strategic Plan goal **to Address Cybersecurity Skills Gaps**. The group **identifies and executes initiatives, strategies, and tactics** to address skill gaps. The group will also develop corresponding metrics to measure progress and success.

Output: Work shapes the **Congressional workforce plan** to “prepare, grow, and sustain a cybersecurity workforce that safeguards and promotes America’s national security and economic prosperity.”

Audience: **Open to public and anyone interested** in furthering the cyber workforce (government, industry, academia, etc.)

Other NICE Working Groups: Promote Career Discovery, Transform Learning Process

NICE Communities of Interest: Apprenticeships, Cybersecurity Skills Competitions, K12/STEM Education, NICE Framework Users

Working Group Objectives:

- **Enhance the capabilities of organizations and sectors** to effectively recruit, hire, develop, and retain the talent needed to manage cybersecurity-related risks
- **Utilize new technologies** such as machine learning and automated approaches to increase connections and fit between employers and job seekers
- **Align qualification requirements** according to proficiency levels **to reflect the competencies and capabilities required** to perform tasks in the NICE Framework
- **Promote the establishment of more entry-level positions** and opportunities that provide avenues for growth and advancement
- **Encourage and enable ongoing development and training of employees**, including rotational and exchange programs, to foster and keep current talent with diverse skills and experiences
- **Nurture effective practices in reskilling** the unemployed, underemployed, incumbent workforce, and transitioning veterans to prepare them for careers in cybersecurity

Priority Objectives & Projects

NICE Strategic Implementation Plan:

https://www.nist.gov/system/files/documents/2021/09/23/Implementation%20Plan_22Sep2021.pdf

Goal 3.0 - *Modernize the Talent Management Process to Address Cybersecurity Skills Gaps*

- **Objective 3.3:** Align qualification requirements according to proficiency levels to reflect the competencies and capabilities required to perform tasks in the NICE Framework
- **Objective 3.4:** Promoting the establishment of more entry-level positions and opportunities that provide avenues for growth and advancement.

Projects in Work:

- Employer
- Job Seeker

How to Join the NICE Modernize Talent Management Working Group?

1. **Email** - NICEtalent+subscribe@list.nist.gov with request to join
 - You will automatically be added to mailing list and monthly meetings
2. **Engage**
 - Join monthly meetings (agenda sent in advance)
 - Email the member list with interesting topics or questions (it takes a village!)
3. **Stay Informed** – review monthly meeting minutes
4. **Check out** - other working groups and communities of interest:
 - <https://www.nist.gov/itl/applied-cybersecurity/nice/community>



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Employer Project / Team

Modernize Talent Management Working Group

Peter Meehan, iQ4 Corp, Co-founder - Cybersecurity Workforce Alliance (CWA)

Co-Leads: Neferteri Strickland, Cybertechnology Strategist
Christopher Will, VP Comtechtel CYBRScore

Mission

Enhance the capabilities of organizations and sectors to effectively recruit, hire, develop, and retain the talent needed to manage cybersecurity-related risks

Deliverables

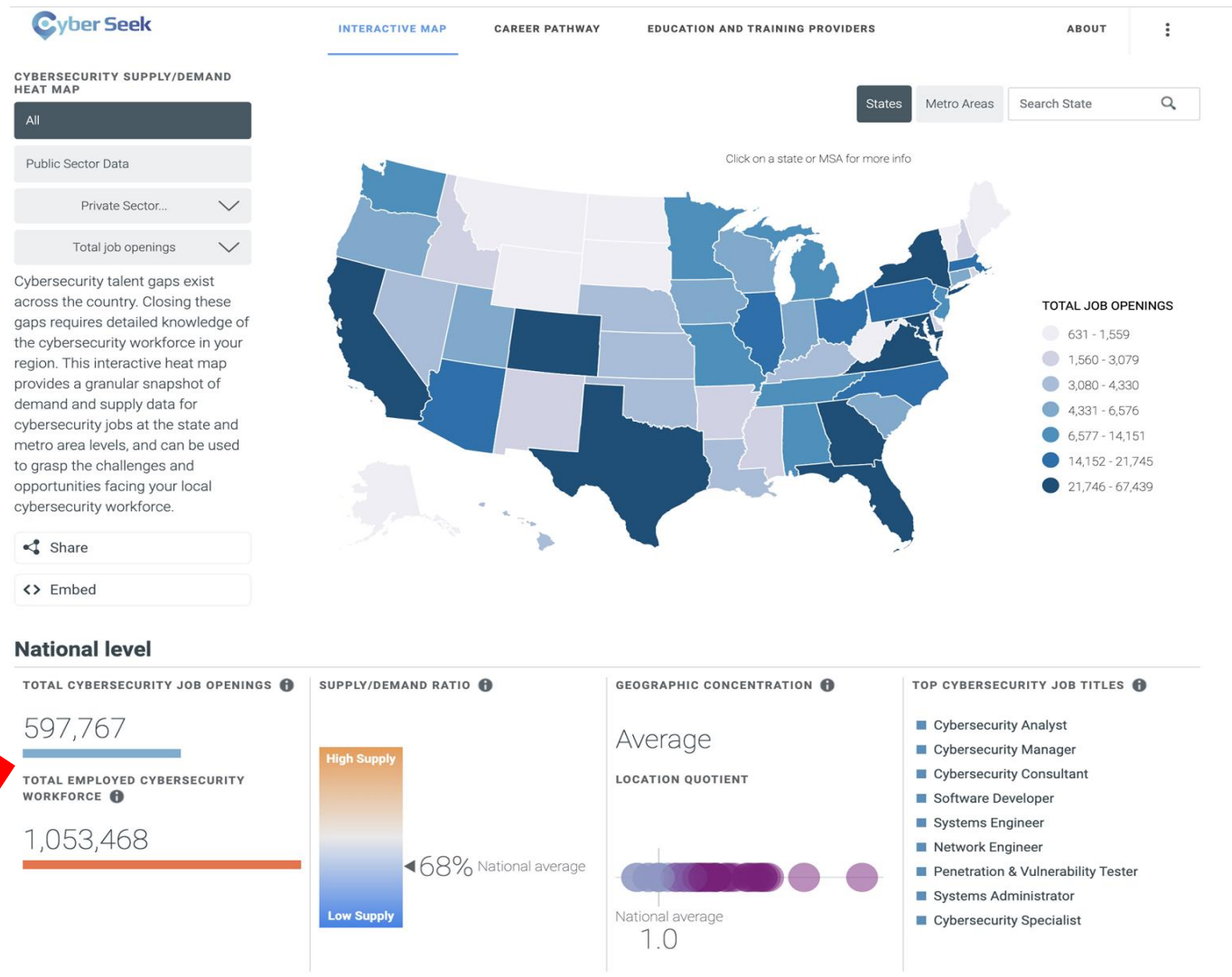
Best Practices: How/why HR/Talent Acquisition and Managers leverage the massive investment in cyber talent development to hire more entrants

WHY?

Despite
15 Years of NICE
and
\$Billions on
Education

Only 8,889
Entry-Level
Vacancies

1.5%



CyberSeek.org

We Need To Build Solutions To.....

- Remove Issues/Barriers?
- Build what employers want
- Develop for pre-and-post-hire
- Retain (and change hiring culture)



MTM Employer Report Structure – By Section



1. Design

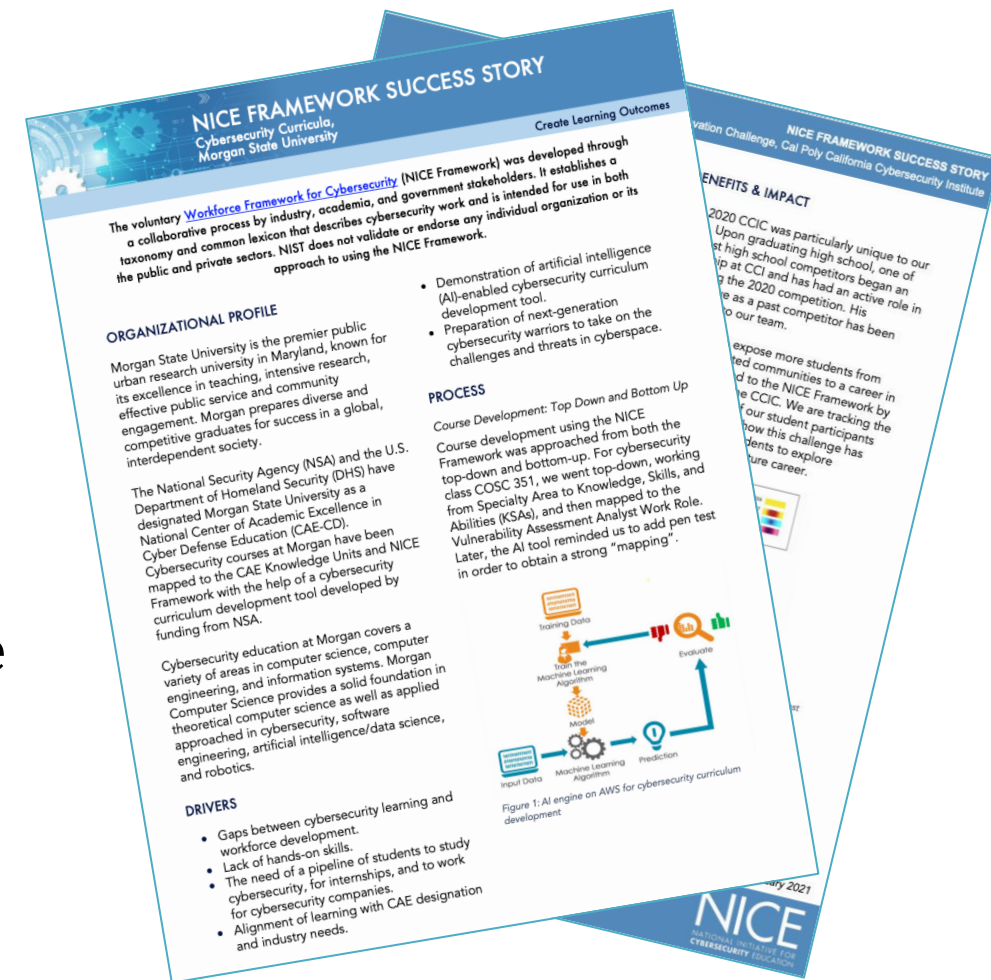
2. Develop

3. Retain/Culture

- Identified Issues (survey results?)
- Success models / options
- Recommend best practices
- Reference

Free Tools

- **NIST-CSF** - widespread adoption, even mandated
- Few are aware that **NCWF** underpins NIST-CSF
- **NICE Taxonomy** - even fewer understand its value

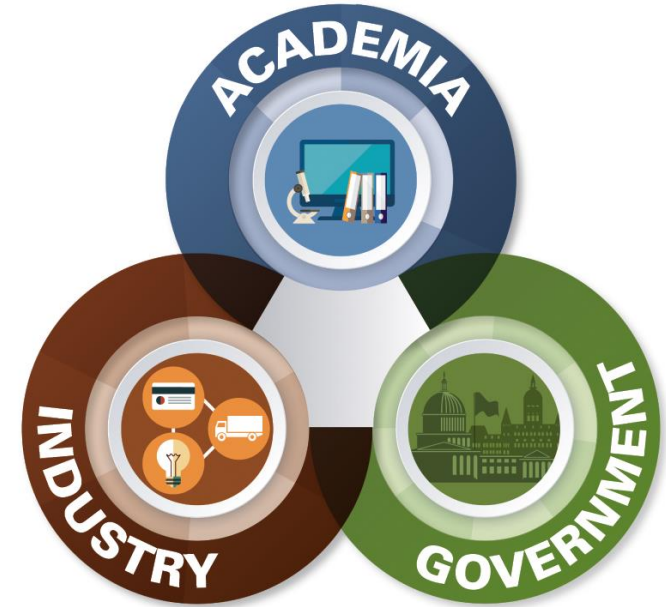


What good looks like



Taxonomy: Foundation for Return on Investment (ROI)

- Maps to need, career pathways, and outcomes
- Aligns better prepared entry candidates
- Aligns KSAs competency assessments
- Captures Related-Work Experience (RWE)



NICE Taxonomy Use Cases



Describes
Employer's
Job Role
Profiles



Aligns Courses
to Learning
Outcomes and
Pathways



Describes
People:
KSAs, Aligned
to Roles,
Learning and
Career
Pathways

Prediction:
Learning and Employment Records (LERs aka Wallets) will replace resumes for career pathways, finding talent or jobs



Hi Robert, This is your **discovery dashboard**. Where do you want to go from here?

Profile



Build out your **Profile** for yourself and employers to showcase who you are and your skills.

[Build My Profile](#)

Skills



Visit your **Skills** section to review and edit them to make sure they are correct. Add some more too if you want.

[Manage My Skills](#)

Career Pathways



Explore your future with **Career Pathways** or check out some alternatives based on your skills & experience.

[Explore Career Pathways](#)

NICE TAXONOMY MATCHES PEOPLE TO LEARNING, CAREER PATHWAYS AND JOBS

Cultural Shift - Taxonomy/ROI Focused



Build talent,
don't expect to buy it!

By 30th June 2022

1. Gather input
2. Write Report

To Join Employers
Project Group:

NICECareerEntryEmployers+subscribe@list.nist.gov

Contact:
Peter Meehan

peter@iq4.com

<https://cybersecurityworkforcealliance.com/>

<https://www.iq4.com/>

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Job Seeker Project / Team

Modernize Talent Management Working Group

Brian Ford, Technical Instructor

Project Scope and Challenge

- **Audience:**
 - Graduates from academic programs that include cybersecurity
 - People transitioning between public sector or military and commercial careers
 - Career changers
 - Faculty advisors and Career Advisement personnel
- **Scope:**
 - Advice about how to successfully enter the cybersecurity job field
- **Challenge:**
 - Hot field littered with jargon with great need for personnel
 - Common miscommunication between job seekers and employers

Job Seeker Guidance

- What this project team is seeking to develop advice about:
- Help candidates and those that advise candidates about how to:
 - Identify Target Employers and Opportunities
 - Research Potential Employers
 - Open a Communication Channel
 - Cover Letter
 - Resume
 - Manage Communications
 - Get Hired

Identify Target Employers and Opportunities

- Two questions:
 - What do you want to do?
 - Where do you want to work?
- What's the right job for you?
 - Professional or Technical
 - What's the job title and qualifications
- Who are the employers in the area you want to work?
 - Identify companies (large and small), organizations, and public sector employers

Research Potential Employers

- CyberSeek dot org connects geography with job roles
- The Internet is your tool!
 - LinkedIn, Indeed, GlassDoor, etc,...
 - Google
 - Chambers of Commerce
- Network
 - Professional Organizations such as CompTIA, ISACA, ISC(2)
 - Local schools, colleges, and universities
 - Conferences and Workshops
 - B-Sides

Open a Communication Channel

- Two important tools: Resume & Cover Letter
- Resume
 - Focus on Employment History & Skills
 - Highlight what you have accomplished that makes you right for a job
 - Make sure that every line makes sense. Avoid Jargon
 - Keep it brief, one page if possible
- Cover Letter
 - Emphasis should be on why the employer should hire you
 - Highlight points from your resume

Manage Your Communications

- Tailor your Resume and Cover Letter
 - Create different versions tailored to employer and position
- Maintain Records
 - What copy of your resume / cover letter you sent to whom and on what date
 - Who you networked with
 - Who you spoke to
- Follow Up!
 - If asked to supply additional info, make sure you know whom to send it to
 - Follow-up and make sure communications were received

Win the Interview

- Prepare
 - Think about how you introduce yourself
 - How do you respond to questions about your experience and skills
- Rehearse answers to questions
 - Be concise
- Prepare questions based on your research
 - Ask about the job applied for
 - Ask about next steps in the hiring process
- Avoid questions answered by looking at Employers website
- The Dreaded “Salary” question

Get Hired!

- What is an offer of employment?
 - What if you receive one offer?
 - What if you receive more than one offer?
- Understand the process
 - Questions to ask
 - Topics to avoid
- Relocation
- Onboarding 101
 - In person
 - Virtual

Where We Are and Where We Are Going...

- We have approximately 20 members of the project team
- Meetings are via Webex every other Tuesday at 3 PM
- We have discussed many topics, but still have more to discuss
- Objectives – Artifact due June 30th
 - A presentation that could be delivered to a student or job seeker audience
 - A presentation for faculty advisers or career placement staff
 - Collaterals (one pagers / posters) for the target audience
- To Join Job Seekers Project Group:
NICECareerEntryJobSeekers+subscribe@list.nist.gov

NICE

NATIONAL INITIATIVE FOR **CYBERSECURITY** EDUCATION



Employer (Develop) Project / Team

Modernize Talent Management Working Group

Neferteri Strickland, Cybertechnology Strategist, CISSP

Project Scope and Challenge

- **Audience:**
 - Recruitment Professionals, HR and Technical Hiring Teams
- **Scope:**
 - Advice to engage with the education and training community to better prepare candidates prior to interview with your organization.
 - Advice to accelerate an employee's first two years of employment.
 - Advice to support employee retention.
- **Challenge:**
 - Competition for qualified cybersecurity workers is intense across all sectors.
 - Employers increasingly are concerned about the relevance of cybersecurity related education programs meeting the needs of their organization.

Employer Guidance

- **Help recruitment professionals communicate with the greater cybersecurity community:**
 - Community outreach/referrals; Prepare, Engage, and Follow Through
- **Help hiring managers and those involved in the training, development, and retention process:**
 - For the recently onboarded
 - Error correcting for the hiring/talent gap dynamic
 - Development through compliance and training (0 - 24 months)
 - Building teams by leveraging Public-Private-Partnerships
 - Retention through compensation tools
 - Managing Compensation/Pay Band/Salary Range expectations
 - Recommendations for Research

Community Outreach and Referrals

- Prepare, Engage, and Follow Through
 - **Prepare:** Leverage market research data and information to understand the mix of training organizations available in your recruitment area. Support efforts to fill gaps that align with your organizational culture and objectives that support the identification of career pathways and work groups and job rotation clusters.
 - **Engage:** All candidates need to be prepared for a 5-6 person interview loop that may consist of 3 to 4 sessions. Offer informational interviews to prepare candidates for what they will experience with your organization.
 - **Follow Through** Community outreach and engagement should be an ongoing effort that aligns with your organization's recruitment goals and information sharing efforts. Leverage the NICE Framework to use a shared common language across community partnering organizations.

For the Recently Onboarded

- Test and Assess, Plan for Success, and Prepare for the Future.

Error correcting for the hiring/talent gap dynamic:

- During the first week of employment, “**Test and Assess**” talent on job related software and systems. Share results with employee to provide them with awareness of their baseline competencies that align with NICE cybersecurity verticals.
- “**Plan for Success**” by co-developing a 12-24 month professional development plan that integrates any identified any gaps between baseline results and current role requirements. This plan can should align with the NICE framework’s Skills, Knowledge, Task, and Work Role vertical.
- “**Prepare for the Future**” by integrating continuing education requirements for any held industry certifications and available training opportunities that align with the next position in their work role, specialty area, or category. This recommendation should take job rotation policies into consideration .

Development Through Compliance and Training

- Building teams by leveraging Public-Private-Partnerships
 - **Develop** mentor programs internal and external to your organization to support upskilling existing talent.
 - **Integrate** internship and apprenticeship opportunities through partnerships with diverse sized organizations (local, national, and virtual).
 - **Create** job rotation opportunities internally and cross organizationally that align with your information sharing objectives. Use this as an opportunity to develop internal micro-credentially that align with work-role and specialty area requirements.

Retention through Compensation Tools

- Managing Compensation/Pay Band/Salary Range expectations
 - Take inventory of the pay and benefits tools available to retain talent. Place an emphasis on efforts to understand what technical and non technical cybersecurity talent values.
 - Create clear pathways of advancement with transparent titles, responsibilities, salary ranges, education, training, and certification expectations.
 - Provide internal salary negotiation training
 - Cover the cost of certification registration, testing, and maintenance fees
 - Align advancement for existing employees to be reflective of new hire salary offers to avoid the perception that a practitioner must leave the company to receive the salary equivalent of new hires.

Recommendations for Research

- Organizational Objectives and Culture Shifts
 - Digital Nomad
 - Switching jobs for wage growth
 - Career stagnation
- KPI and social mission alignment
- Flexible Roles
 - KSA links
 - Remote/On-site
- Internal training programs based on work-role progression
- Role and Responsibilities vs Cost of Living Wages
- Regional partnerships for information sharing and workforce dev/recruitment

Where We Are and Where We Are Going...

- We have approximately 15 members of the project team
- Meetings are via Webex every other Thursday at 11 AM
- Objectives – Artifact due June 30th
 - A presentation for HR and recruitment professionals to use that traces to NIST publications, resources, and recommendations to develop processes to:
 - Error correct for the hiring/talent gap dynamic
 - Building teams by leveraging Public-Private-Partnerships
 - Managing Compensation/Pay Band/Salary Range expectations
- To Join Job Seekers Project Group:
NICECareerEntryJobSeekers+subscribe@list.nist.gov

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DEMYSTIFYING CYBERSECURITY

Integrated Approaches to
Developing Career Pathways

FIU | FLORIDA
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 **NEW
AMERICA**

Cyber4Work: Growing the Cyber Workforce in Mississippi

Sarah Lee

Director and Professor, School of Computing Sciences and
Computer Engineering
University of Southern Mississippi

Cyber4Work

Growing the Cyber Workforce in Mississippi

Dr. Sarah Lee, Director
School of Computing Sciences &
Computer Engineering

usm.edu/computing

mscoding.org



THE UNIVERSITY OF
SOUTHERN MISSISSIPPI®

Background

Mississippi Alliance for
Women in Computing
(NSF INCLUDES
1649312)

**Goal: Create &
illuminate pathways for
learning that make
computing education
accessible for all**



This material is based in part upon work supported by the National Science Foundation under Grant Number NSF INCLUDES 1649312. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation

Background: Poverty in Mississippi

19.6% of Mississippians live below the poverty line

- highest of any state in the US
- national average of 11.4%.

Lowest median household income of any state → \$44,966

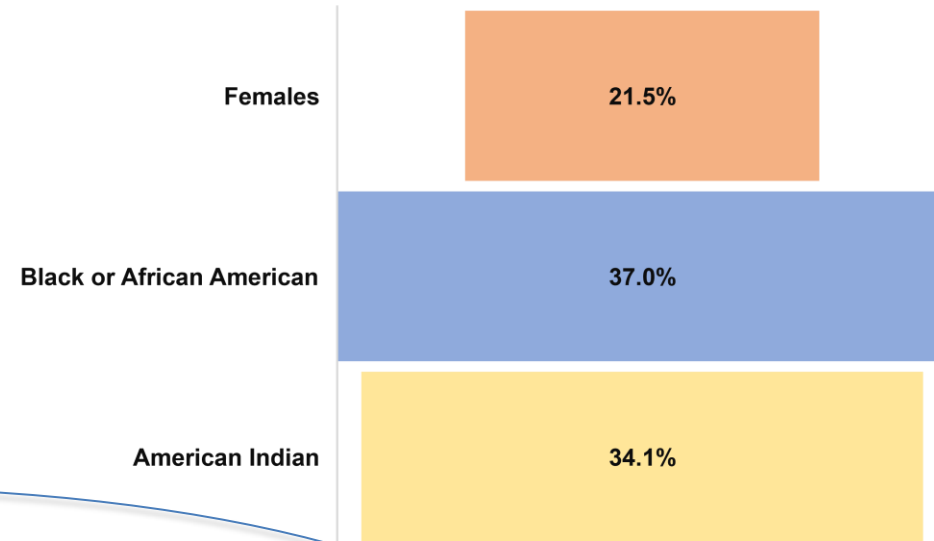
Why so much poverty?

- Unemployment
- Limited or no access to post secondary education

Educational attainment levels among the lowest in the U.S.

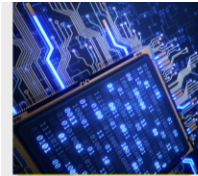
- ~84% of adults graduate high school
- ~22.8% of adults have at least a Bachelor's degree. (US 37.9%)

- Inherited poverty
- Systematic exclusion of racial and ethnic minorities





Alternative Pathways



Educational Pathways to Support Economic Dev.



Early Engagement is important



Cyber4Work



MISSISSIPPI CYBER INITIATIVE

Educational Pathways are not *one size fits all!*

To address inequities in the state, we must provide alternative pathways to education/training and higher wage jobs and help learners persist on those pathways into the workforce

The Mississippi Coding Academies

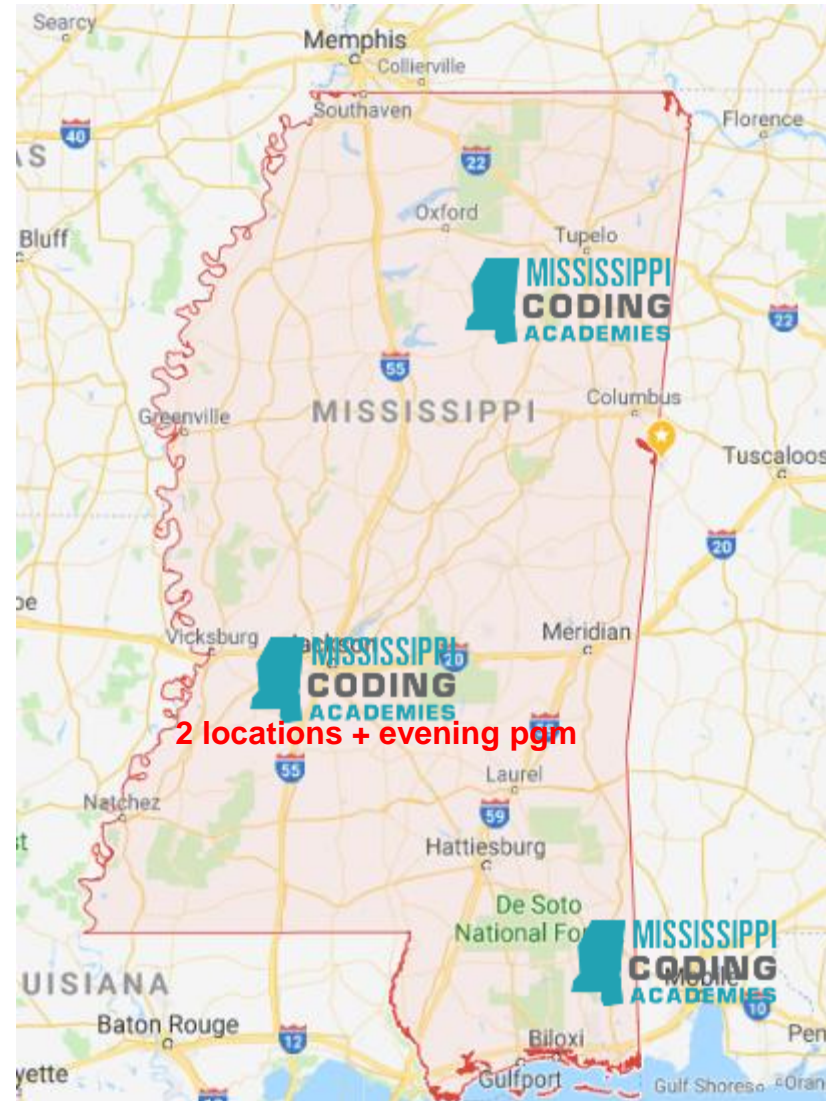
Tuition-free, 11 months training founded 2017

Employer-driven curriculum + professional skills training

Full-Stack (front-end to back-end) software development

Service/community engagement component

Assistance with job placement



MCA National recognition



MIT Solve Reimagining the Path to Employment

- November 2020: Top 10 Finalist out of 191



XPRIZE Rapid Reskilling

- December 2020: Top 10 of 360 Registered Teams

MCA Results To Date



124
completers

70%
Black/African
American

30% female

75%
completion
rate

90%
placement
rate

Cost per
participant of
~\$12,000



Challenges

Time Investment Required

Obstacles to a 5 day a week model include childcare, elder care, need for part-time employment to pay bills while training

MUST KEEP THE CURRICULUM RELEVANT

Cyber4Work

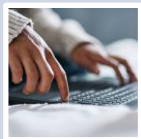


Cyber Training
Launched 12/2021

Cybersecurity
Awareness
CompTIA
Security Skills



Partnership: Mississippi Coding
Academies & The University of
Southern Mississippi



USM is a CompTIA Academic
Partner



Cyber4Work Project Team

Julia Fink,
Consultant/
Program
Manager



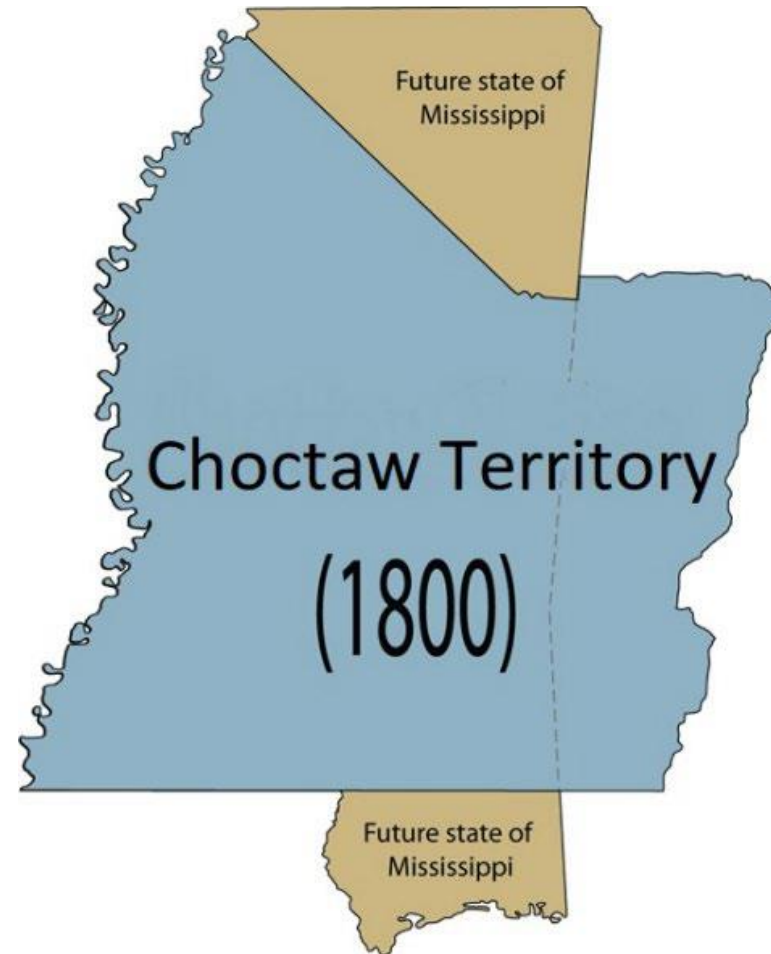
Anna
Denson,
MBCI
Program
Manager



Terry Cullum -- Charan Gudla -- Jeremy Graves
Instructional Team (USM faculty)

Mississippi Band of Choctaw Indians - Legacy

- When the Treaty of Dancing Rabbit Creek was signed, there were over 19,000 Choctaws in Mississippi.
- From 1831 to 1833, approximately 13,000 Choctaws were removed to the west. More followed.
- Members of the Mississippi Band of Choctaw Indians are descendants of those who refused to be removed to Oklahoma in the 1830s.



Original Choctaw Territory encompassed 50 million acres of land in what is now Mississippi & Alabama

MBCI Training

Developing a Cyber Workforce



- Hybrid approach to learning with face-to-face and virtual
- 69 MBCI adult learners trained in 6 months – 49% female
- Summer 2022:
 - MBCI Youth Opportunity Program (YOP) - 24 Choctaw high school students enrolled in CompTIA IT Fundamentals training
 - Patterned after **JROTC-CS Demonstration Project Summer Cyber Academy from 2020**



Other Cyber4Work Locations

Mississippi Coding Academy Biloxi

Cybersecurity
Foundation/Awareness Training
completed

CompTIA Security+ training
underway

14 learners

Mississippi Coding Academy Jackson

Starting in July 2022

Mississippi Coding Academy statewide (virtual)

Launch state-wide virtual cohort
for IT Fundamentals followed by
Security+



TechSpark Jackson

Microsoft Investment in MS

- Building digital skilling opportunities, computer science education, tech enablement and impactful, sustainable projects
- Partners: Jackson State University, InnovateMS, gener8tor, Bean Path
- Gener8tor Skills Accelerator
 - five-week digital and workforce skills training program



On-ramps to Cyber Security Workforce Training

Tech background

Mississippi Coding Academy learner/completer

Community College or other computing coursework

Programs for high school students

Gener8tor Skills Accelerator

Scaling an onramp in Mississippi

- USM and local non-profits partnering to bring customer service and sales training to very rural areas of Southwest Mississippi
 - Layering cybersecurity awareness
- Those that excel will have opportunity to on-ramp to Cyber4Work

Mississippi Cyber Initiative

@MS_Cyber_Init

- Launched in 2021 to address state and federal cyber workforce and security challenges
- Core Team: Mississippi State University, Mississippi Gulf Coast Community College, and the University of Southern Mississippi
- Collaboration between community colleges, 4-year institutions, industry, and military



The Last Mile Education Fund **disrupts** the traditional scholarship model by **investing** in striving students via just-in-time financial supports to get them to graduation.

lastmile-ed.org 

Microsoft Cybersecurity Scholarship Program

The Last Mile Education Fund and Microsoft are working together to address the diversity and talent shortages in the cybersecurity workforce by investing in striving community college students. We are looking to fund over 450 community college students this year!



Microsoft Cybersecurity Scholarship Program



- Who is eligible to apply?
 - Students currently **enrolled in a cybersecurity-related program at a two-year institution**, such as a community college or technical school, AND
 - Students who are **able to demonstrate financial need** by providing Pell Grant eligibility and/or financial aid award letters.
- What kind of assistance is available?
 - Emergency **financial assistance up to \$500**, OR
 - Subsidies to cover the cost of **cybersecurity certification licensing exams up to \$375**
 - Free **LinkedIn Premium** account
 - Access to **GitHub Student Developer Pack**
- What documents are required for the application?
 - A **current transcript** including major/minor areas of study or technical certification pathway
 - A Pell Grant eligibility and/or **financial aid award letter** or other documentation showing evidence of need.
 - **LinkedIn profile**
 - A verified **PayPal account**, if requesting emergency financial assistance



“The growth and development of people is the highest calling of leadership.”

~Harvey S. Firestone



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