Immersive Cybersecurity Workforce Development Program to Prepare Current and Future Workforce in Critical Infrastructure

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Project Goal

Develop a sustainable, skills-based, competency-focused workforce development program to educate and train existing and future workforce in four critical infrastructure sectors

- Energy
- Government facilities
- Finance
- Telecommunications

Objectives

- Objective 1: Create stackable, scalable, and workforce-ready curricula mapped to NICE Cybersecurity Workforce Framework and DOD Cyber Workforce Framework (DCWF) work roles and competencies.

- Objective 2: Develop/use a prior aptitude assessment tool to match participants' skills and intentions to various curricula and offer the most effective one.

- Objective 3:
  - 3.1 Create a recruitment plan targeting veterans, transitioning military, military spouses, first responders, and working professionals in the technology, energy and financial sectors.
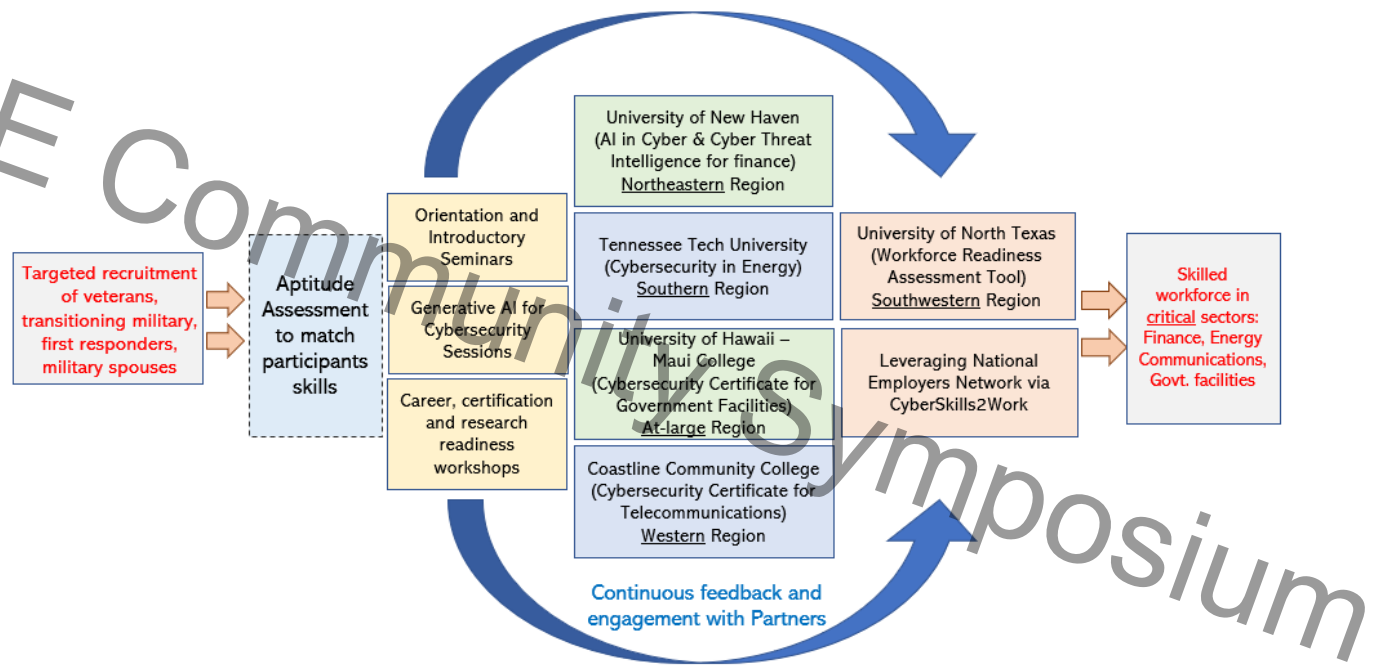 - 3.2 Offer pathways

Objectives (cont'd)

- Objective 4: Develop a workforce readiness assessment tool to map participants' skills and knowledge to job descriptions and work roles.

- Objective 5:
  - 5.1 Conduct series of mini workshops to train all participants across the coalition on the use and applications of Generative AI in Cybersecurity.
  - 5.2 Conduct workshop series on information session, orientation, career readiness, certification readiness, and research readiness.

- Objective 6: Help participants find employment by leveraging the national employers' network created by CyberSkills2Work coalition and also using our own employer partners.

Project Model

Targeted recruitment of veterans, transitioning military, first responders, military spouses

→ Aptitude Assessment to match participants skills

- Orientation and Introductory Seminars
- Generative AI for Cybersecurity Sessions
- Career, certification and research readiness workshops

University of New Haven (AI in Cyber & Cyber Threat Intelligence for finance)
Northeastern Region

Tennessee Tech University (Cybersecurity in Energy)
Southern Region

University of Hawaii – Maui College (Cybersecurity Certificate for Government Facilities)
At-large Region

Coastline Community College (Cybersecurity Certificate for Telecommunications)
Western Region

University of North Texas (Workforce Readiness Assessment Tool)
Southwestern Region

Leveraging National Employers Network via CyberSkills2Work

→ Skilled workforce in critical sectors: Finance, Energy Communications, Govt. facilities

Continuous feedback and engagement with Partners

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Project Uniqueness and Innovation

- Innovative workforce readiness assessment tool

- Workshop series on Generative AI

- AI and Cyber pathway

- Information and orientation workshop series for all participants

- Centralized portal for applicants

Courses and Pathways - UNewHaven

Pathways	Courses	Cohort 1	Cohort 2 (optional year)
Cyber Threat Intelligence for Finance Professionals	Introduction to Cyber Threat for finance	Fall 2025	Fall 2026
	Cybersecurity Incident Response and Management for finance	Spring 2026	Spring 2027
	Cybersecurity Risk Assessment for finance	Spring 2026	Spring 2027
AI in Cybersecurity	Introduction to Data Science and Python	Spring 2026	Spring 2027
	Introduction to Machine Learning	Summer 2026	Summer 2027
	AI and Cybersecurity	Summer 2026	Summer 2027

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Courses and Pathways - Hawaii

Pathways	Courses	Cohort 1	Cohort 2 (optional year)
Certificate of Competence (CO) in Cybersecurity	Digital Tools for the Information World	Spring 2025	Summer 2026
	Introduction to Information Security	Summer 2025	Fall 2026
	Introduction to Networking	Fall 2025	Spring 2027
	Introduction to Computer Security	Spring 2026	Summer 2027

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Courses and Pathways – Tenn Tech

Pathways	Courses	Cohort 1	Cohort 2 (optional year)
Cybersecurity Certificate for Energy Sector	Introduction to Cybersecurity and Privacy	Summer 2025	Fall 2026
	IT Security	Fall 2025	Fall 2026
	Software and Systems Security	Spring 2026	Spring 2027
	Special Topics: Secure Energy Systems	Summer 2026	Summer 2027

Courses and Pathways – Coastline

Pathways	Courses	Cohort 1	Cohort 2	Cohort 3 (optional year)
Cybersecurity Fundamentals	Introduction to Cybersecurity	Spring 2025	Summer 2025	Fall 2026
	Computer Networking Principles (Network+)	Summer 2025	Fall 2025	Fall 2026
	Contemporary Operating Systems (Server+)	Summer 2025	Fall 2025	Spring 2027
	Introduction to Python Programming	Fall 2025	Spring 2026	Spring 2027
	Network Security (Security+)	Fall 2025	Spring 2026	Summer 2027

Targeted Number of Participants

| Institution	Year 1	Year 2	Year 3 (optional)
University of New Haven	In development	40	20
Tennessee Technological University	25 will start in year 1 & continue in year 2	25	10
University of Hawaii – Maui College	30 will start in year 1 and continue in year 2	30	30
Coastline College	15	15	15
University of North Texas	Tool development	Tool use and data collection	Tool use and data collection
Yearly Total	70	110 (55 new)	75 (all new)
Cumulative Program Total	70	125	200

Innovative Workforce Readiness Assessment Tool
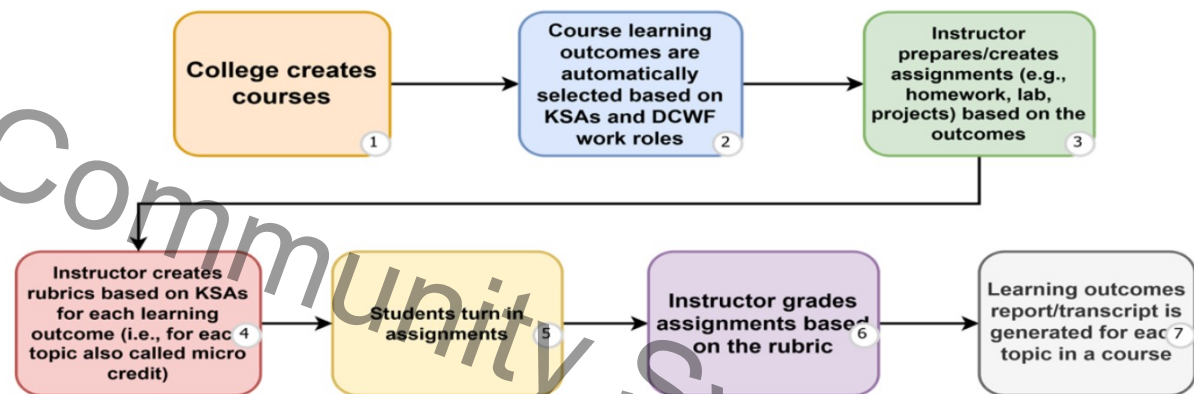
Figure 2. Workforce Competency Tool (WCT) high-level view and overall flow

Workshop Series on Generative AI

- Co-PI Gupta and team from Tennessee Tech University will conduct a series of mini-workshops on the use of GenAI in cybersecurity.

- The workshop's objective is to impart knowledge about GenAI technology, like ChatGPT, and offer a hands-on experience to comprehend its cybersecurity implications.

- The workshop is designed to bridge the gap between cybersecurity professionals and GenAI technology, fostering the benefit of both offensive and defensive security efforts.

Workshop Series on Generative AI (cont'd)

- Topics:
- Introduction to GenAI technology and mechanisms behind it
- Attacking ChatGPT for ethical and privacy violation
- GenAI for cyber offense
- GenAI for cyber defense

Questions?

- **Tirthankar Ghosh, University of New Haven**
- **Maanak Gupta, Tennessee Technological University**
- **Debasis Bhattacharya, University of Hawaii - Maui College**
- **Tobi West, Coastline College**
- **Ram Dantu, University of North Texas**

2025 CAE Community Symposium

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