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March 4, 2024

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## **RE: Cybersecurity Program Report**

Enclosed please find a report pursuant to Chapter 54 of 2022, which created Section 89270 of the Education Code, relating to the California State University Cybersecurity Regional Alliances Multi-stakeholder Partnerships Pilot Program. This program is being implemented as a Workforce Innovation Tech Hubs Cyber initiative (WITH-Cyber), led by CSU San Bernardino and partners Fresno State University and San Jose State University.

This report covers the reporting period from 9/2023 to 2/2024 and outlines the guiding principles for the project, the partner institutions, and regional and discipline-centered strategies to help California solve the 50,000-person deficit in the cybersecurity workforce.

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Should you have any questions, please contact Nathan Dietrich, Assistant Vice Chancellor, Advocacy and State Relations at (916) 445-5983.

Sincerely,



Steven Relyea (Mar 4, 2024 11:56 PST)

Steve Relyea  
Executive Vice Chancellor and  
Chief Financial Officer

SR:dr

Full report posted to <https://www.calstate.edu/impact-of-the-csu/government/Advocacy-and-State-Relations/Pages/legislative-reports.aspx>

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## CHAPTER 54 of 2022

An act creating Section 89270 of the Education Code, relating to the California State University.

In September of 2023, the California State University selected three campuses to run the Cybersecurity Regional Alliances Multi Stakeholder Partnerships Pilot Program. The goal is to establish regional pipeline programs with California Community Colleges to increase the number of cybersecurity workers in the state. The three campuses, CSU San Bernardino, Fresno State, and San Jose State were selected due to their history and qualifications for running successful cybersecurity workforce projects in a variety of disciplines.

Consistent with the White House National Cyber Workforce and Education Strategy, this program will strengthen our cyber workforce, connect people to well-paying, quality jobs, and advance the welfare, prosperity, and security of Californians (White House Office of the National Cyber Director, July 2023). Our program aims to foster collaboration between education, government, and industry to meet immediate and long-term workforce needs.

Going forward, the project will be branded as the Workforce Innovation Tech Hubs Cyber initiative (WITH-Cyber). WITH-Cyber will establish a statewide cyber workforce educational ecosystem within California starting with the initial three regions; the Inland Empire, Central Valley, and Bay Area. This comprehensive program leveraging collaborative workforce development ecosystems is designed to meet the future State of California cyber workforce demands. The CSU estimates that in the first year nearly 400 students would benefit directly from camps and online experiences. Leveraging other related grant funded activity, about 2000 students are likely to benefit from this initiative. Ultimately, WITH-Cyber will provide resources for K-12, community colleges, and universities in regional hubs to create workforce pipelines and educational programs that emphasize the creation of local initiatives and replicable models throughout the state.

### **Strategic Planning and Goal Setting**

WITH-Cyber is currently in the first phase that consists of goal setting and strategic planning. The starting point has the following project principles:

- 1) Recognize the diverse skill sets in cybersecurity by using the unique cyber expertise at the three primary CSU institutions in computer science and engineering, homeland security, and business IT and data science. All of these areas reflect broad disciplines that have underserved cybersecurity needs.
- 2) Leverage national efforts that are reflected in the White House National Cyber Workforce and Education Strategy. This will enable WITH-Cyber to jump start California efforts with both Federal and State resources.
- 3) Proliferate the use of cybersecurity educational standards such as the National Security Agency's Centers of Academic Excellence in Cybersecurity (CAE) to increase the number and quality of cybersecurity programs in community colleges and universities.

- 4) An emphasis on proven workforce expansion strategies including career technical education (CTE), apprenticeships, internships, competitions, and camps.

These principles will drive the implementation process, beginning with logic modeling, a process of reverse engineering that is employed to create a pathway between available resources and expertise to the ultimate goal of a robust California cybersecurity workforce. The logic model will drive us towards measurable outcomes to ensure success.

#### CSU San Bernardino (CSUSB)

CSUSB is a leader in training and postsecondary education in the state of California and nationally. Through their work with the National Centers of Academic Excellence (NCAE) program at the National Security Agency, CSUSB leads the Centers of Academic Excellence in Cybersecurity Community (CAE Community), a national center supporting 440+ community colleges and universities as well as a cyber range serving over 600 educational institutions. CSUSB has seven interdisciplinary cybersecurity degrees and has built a strong regional hub with the Inland Empire Cybersecurity Initiative (IECI), youth programs, industry and government employers, and curriculum.

#### Fresno State (FSU)

FSU has been leading a variety of California Cybersecurity Education and Workforce Development programs and initiatives in conjunction with the State of California. One key initiative includes the development and implementation of a California Cybersecurity Career Education Pipeline and Pathway Program (C3EP3) at all levels of education. C3EP3 is developed in coordination with the California Cybersecurity Task Force, Workforce Development and Education Subcommittee. The Task Force is co-led by the California Governor's Office of Emergency Services (Cal OES), California Department of technology, and the California Cybersecurity Integration Center. Fresno State is also working with the California Division of Apprenticeship Standards (DAS) to develop a stacking series of apprenticeship programs and occupational frameworks for workforce development from entry level cybersecurity work roles to advanced specializations like cybersecurity engineering and AI jobs.

#### San Jose State (SJSU)

SJSU produces the greatest number of cyber engineers to the Silicon Valley tech industry. Led by two PIs in College of Science (CS Professor and Chair) and in College of Engineering (Assoc. Dean and CMPE Professor), the SJSU project team includes enthusiastic cyber experts from five different colleges (Science, Engineering, Business, Social Sciences, and Professional and Global Education), and is strongly supported by K-16 education experts and cyber ethics researches from two other colleges (Education and Humanity and Arts). SJSU will leverage efforts in STEM, K-16, and unique industry partnerships as part of the WITH-Cyber program.

While the logic model is being developed, the three campuses are already formulating plans to develop a cyber Doctoral program, summer camp program, curriculum/resource repository, a cyber-range, and state-wide mentor activities for community colleges and

universities. The short duration of funding, a shortfall of 50,000 cyber workers in California, and the complexities of evangelizing cybersecurity within education are difficult challenges, but we are confident that CSU San Bernardino, Fresno State, and San Jose State are up to the task.

### **California State University, San Bernardino (Lead) Profile and Effort**

For the last 12 years, California State University, San Bernardino (CSUSB) has sought to develop a world-class cybersecurity workforce in our region, state, and nation to attract industry and promote economic development. CSUSB is a leader in training and postsecondary education in the state of California and nationally. Through our work with the National Centers of Academic Excellence (NCAE) program at the National Security Agency, CSUSB leads the Centers of Academic Excellence in Cybersecurity Community (CAE Community), a national center supporting 440+ community colleges and universities as well as a cyber range serving over 600 educational institutions. CSUSB has created a collaborative model of idea to action with partners across the nation, all focused on growing opportunities for the training and education of the cybersecurity workforce.

I. The WITH-Cyber effort, lead by CSUSB will include leveraging existing efforts and new initiatives to benefit the state of California and help with the cyber workforce shortage:

- 1) Promote the adoption of the national Centers of Academic Excellence (CAE) in Cybersecurity in California Community Colleges and Universities. The standards in this designation are well-accepted and enable communities to create cyber ecosystems.
- 2) Engage with the National Cybersecurity Training and Education Center (NCyTE), a National Science Foundation funded Advanced Technology Education Center focused on Community College cyber workforce and faculty initiatives (70 colleges and universities in California) to provide resources, curriculum, and faculty development. CSUSB is on the leadership team for this project and has a decade of success in linking CTE, community colleges, and resources.
- 3) Establish a cyber range based on skill-based learning and assessment. CSUSB is home to Experience Cyber (XP Cyber) and the NICE Challenge Project cyber range that provides FREE access to critical technologies for learning and cyber skills assessment to over 600 colleges and universities. Through the cyber range, WITH-Cyber will expand capacity and provide workforce readiness resources specific to California's needs.
- 4) Expand the Inland Empire Cybersecurity Initiative (detailed below) as a best-practice model based on a history of real apprenticeship placements as noted at launch by the Governor and Secretary of Labor.
- 5) Build a series of youth engagement camp experiences based on the nationally recognized GENCYBER camp at CSUSB. These camps target Title I schools and have worked with employers such as Bank of America, Google, Northrop Grumman, and more.

II. Regional program highlight, Inland Empire Cybersecurity Initiative:

In 2021, CSUSB launched the Inland Empire Cybersecurity Initiative (IECI), a coalition of K-12 schools, community colleges, and employers to create an established pathway of apprenticeship and work-based learning. Students are placed with both regional and national employers and the Inland Empire region now leads the state in cyber apprenticeships. New apprenticeship partner

employers include ESRI, Loma Linda University Medical, San Manuel Band of Mission Indians, City of Moreno Valley, and County of Riverside.

## **Fresno State University Profile and Effort**

Fresno State faculty have developed a California Cybersecurity Workforce Development and Education Strategy and Framework and California Cybersecurity Career Education Pipeline and Pathway Project (C3EP3) with the California Cybersecurity Task Force, Workforce Development and Education Subcommittee, led by the California Cybersecurity Integration Center, California Governor's Office of Emergency Services (Cal OES) and California Department of Technology.

### **I. Fresno State University Cybersecurity "Soft Start", K-12, and Higher Education Initiatives:**

- 1) Expansion of the "Soft Start IT-Cybersecurity Education & Workforce Collaborative" Grant funded pilot program into a statewide model program. The program recruits students for cyber education and workforce in public facing introductory courses in the public library, adult education centers, community colleges, and eventual student transfer into CSU stacking cybersecurity certificate programs.
- 2) K-12/Adult Education - Provide Subject Matter Expert support to school districts, campuses, students, faculty, and staff to launch cybersecurity education, awareness, and training programs.
- 3) 2-Year and 4-Year degree program development/collaboration in cyber fields including Homeland Security, aligned to the NCAE Program.
- 4) Internal Cybersecurity Degree elevation from minor to B.S. Degree in Cybersecurity with options representing various aspects of the cybersecurity enterprise, Engineering, Computer Science, Business, and Social Sciences/Education.
- 5) Graduate program development - Aid in the development of Master's and Doctoral Cyber programs including the formation of a potential doctoral program in cybersecurity in a multi-campus consortium format and enhanced capacity of joint UC/CSU campus affiliations.

### **II. Fresno State University Cybersecurity Workforce Development Initiatives:**

- 1) Assist as a conduit for the State of California (and local government) through the California Government IT-Cybersecurity Personnel Initiative (CGIPI).
- 2) Implement California cybersecurity workforce initiatives referenced in the 2023 California SLCGP Cybersecurity Plan to include Traditional ("Academic") and Non-Traditional ("Skill/competency") pathways and national standards such as the NCAE Program.
- 3) Implementation of a campus IT-Cybersecurity-AI internship pilot program, curriculum, and framework with Information Security/Tech Offices for students across campus. Deploy internship pilot program CSU systemwide.
- 4) Complete the California Division of Apprenticeship Standards IACA IT-Cybersecurity-AI Stacking Certificate Program Registered Apprenticeship Model Occupational Framework. Work with partnering industry, public sector, academia, and CBOs.

### **III. Fresno State University Education Infrastructure Capacity Building Initiatives:**

- 1) Organize/participate in Cyber Workforce/Education Meetings, Summits, and Research Conferences.
- 2) Promote Cybersecurity Lab design and rollout
- 3) Promote cybersecurity education, grant opportunities, and partnerships across the CSU.

## **San Jose State University Profile and Effort**

The SJSU team is excited to be part of the WITH-Cyber project. Located at the heart of Silicon Valley, SJSU produces the greatest number of cyber engineers to the Silicon Valley tech industry. Led by two PIs in College of Science (CS Professor and Chair) and in College of Engineering (Assoc. Dean and CMPE Professor), the SJSU project team includes enthusiastic cyber experts from five different colleges (Science, Engineering, Business, Social Sciences, and Professional and Global Education), and is strongly supported by K-16 education experts and cyber ethics researchers from two other colleges (Education, and Humanity and Arts). SJSU will focus on:

### **I. Increasing the Number of Students in Cybersecurity Degrees/Certificates/Minors**

- 1) Developing/offering Curriculum Pathways to a Diverse Set of Majors - Building on cybersecurity certificates in CS and CMPE, SJSU will build cybersecurity curriculum pathways (including concentration, certificates, and minors) in other academic programs and colleges.
- 2) Recertification as an NSA Center of Academic Excellence in Cyber Defense. Through building and expanding the cybersecurity curriculum, we plan to recertify SJSU as an NSA CAE, which will connect SJSU in the national efforts in cybersecurity education/research.
- 3) Expanding Women and Minority Students in Cyber – Building on a \$800K grant from CIC (Center for Inclusive Computing) to increase the number of women and minority students in computing in Oct 2021, the WITH-Cyber program will work to attract many more women and minority students through stackable cybersecurity certificates.
- 4) Establishing an Interdisciplinary, Applied PhD program in cybersecurity related areas - this would grow cybersecurity research and provide advanced, applied cyber researchers for employers and colleges.

### **II. Extending Community Colleges and K-12 Pathways and Outreach Programs**

- 1) Leveraging the current Bay Area K16 Collaborative, SJSU will build high-quality, high-demand education pipelines in the region through developing dual enrollment and articulated pathways in cybersecurity with key industry partners.
- 2) Leveraging the HSI STEM grant, this program will expand pathways from local community colleges (CC) to STEM majors, including pathways in cybersecurity.
- 3) Leveraging the “Jay Pinson STEM Education Program,” including support received from NSF CS4All program, this program will educate K-12 CS teachers and develop curriculum around cybersecurity based on national standards.

### **III. Industry Employer Engagement and Community Partnership**

- 1) Enhancing Industrial/Community Partnership – Integrating the extensive collaborations with partners such as City of San Jose, Santa Clara County, and companies such as Google,

Apple, Meta, Amazon, Microsoft, Cisco, AT&T, IBM, Dell, Nvidia, Splunk, TrendMicro, Walmart, and ServiceNow to promote co-ops and capstone projects.

- 2) Expanding CyberAware Day events to include participants from other CSU campuses.