Challenges in Cybersecurity Education

How Industry Can Help Fill the Gap

Welcome!!!

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Mount St. Mary's University, Emmitsburg, MD

- The cybersecurity program is part of the School of Science, Mathematics & Technology.

- Growing Cybersecurity B.S. degree program, as well as a Cybersecurity and Computer Science Double Major and Cybersecurity as a Minor

- Presently pursuing designation as a National Security Agency Center of Excellence (CAE-CD)

- The Mount is in the top 10% of colleges and universities nationwide in terms of the long-term earnings for a four-year college degree

- https://msmary.edu/academics/majors-minors/cybersecurity.html

Capitol Technology University
Laurel, MD

Signal-9 Cyber Competition Team

Space Engineering

Winner SC 2020 awards

America's Best Cybersecurity Program 2020

Capitol Tech's SOC Recognized by National CyberWatch Center for its Innovations in Cybersecurity 2020

DISA signs first Education Partnership Agreement with Capitol Technology University 2022

AI Center of Excellence (AICE) Launched 2024

Capitol Technology University Partners with Maryland Blockchain Association for Educational Opportunities 2025

The nation's first:

- o **Online Masters in Cybersecurity 2001**
- o **Doctorate in Cybersecurity 2010**

o **Over 12 cybersecurity programs from AAS to DSC/PhD**

o **First designated as a National Security Agency Center of Excellence (CAE-CD) in 2003**

o **Forbes ranked Capitol among the top 8% in the nation. Rankings are based on specific data related to student success, return on investment, alumni influence, impressive graduation rates, high graduate salaries, great outcomes for low-income students, and additional standards of excellence.**

o **Georgetown ranked Capitol #213 out of 4,500 schools for return on investment, based on a 20-year net present value (NPV), as reported by Georgetown University in "*A First Try at ROI: Ranking 4,500 Colleges*."**

Job Guarantee

o **If you graduate with a qualified bachelor's degree, you'll find a position in your field of study within 90 days of graduation. If you don't, Capitol will provide up to 36 additional undergraduate credits—tuition-free—while you continue your job search.**

Salary Guarantee

o **You will graduate and earn at least $60,000 per year, or Capitol Tech will assist you in repaying your educational loans. Students enrolling in any of the on-campus undergraduate full-time degree programs and who have at least 60 credits to complete their degree are eligible for this program.**

o **https://www.captechu.edu/fields-of-study/cyber-and-information-security**

Challenge: Workforce Demand vs. Educational Pipeline

- Cybersecurity gap continues to grow – over 500,000 unfilled positions in the U.S. (Cyberseek, 2024)

- In 2023 – 2024, 11,790 students enrolled in Associate degree programs (increase of 26% over previous year). (GrayData, 2024)

- Undergraduate certificate programs grew 18% in same period.

- U.S. Bureau of Labor Statistics projects a 33% growth rate for information security analyst positions from 2023 to 2033, significantly higher than the average for all occupations. (BLS,2025)

Challenge: Rapidly Evolving Threat Landscape

- Cyber threats evolve faster than curriculum updates, making it difficult to keep course content relevant.

- Emerging threats, such as AI-driven attacks, quantum computing risks, and new strategies, such as Zero Trust Architecture require continual curriculum adaption.

- Shortage of academically-qualified faculty with recent, real-world experience in offensive security, cloud security, and advanced threat-hunting.

Challenge: Gap in Technical and Soft Skills

- Employers report graduates often lack expertise in emerging technologies
- Soft skills such as communication, business acumen, and policy awareness are essential but often underemphasized in programs
- There is a need for interdisciplinary approaches, combining cybersecurity with law, policy, and business risk management

Challenge: Inconsistencies in Position Descriptions

- Cybersecurity versus Computer Science
- Experiential requirements exclude recent graduates (required years of experience with versus familiarity with)
- Weight of cyber ranges, CTF competitions, projects

Asks: Expanded Academia/Industry Partnerships

- Need strong participation with Advisory Board to ensure we are producing graduates meeting industry needs
- Need expanded partnerships between academia, government agencies and private-sector firms to enhance student learning experiences
  - Zoom presentations from industry participants
  - Faculty-led/monitored internships in conjunction with industry partner

Questions:

- What technical skills are sought for the next 5 years (e.g. cloud security, threat intelligence, ZTA, AI Governance/Security)?

- What soft skills should be emphasized (communication, business acumen, policy awareness)?

- Should universities embed industry certifications within degree programs to improve graduate employability?

- Survey