

# Designing for Sustainability-- Women in Cybersecurity

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**OLD DOMINION**  
UNIVERSITY

When the forcing functions are cyber attacks on our financial systems or national security systems, we won't be looking to see who is female or male in filling the position. We will want the best and brightest. It's not a question of if these attacks are going to happen, rather it is when and how often.

**The time to act is NOW.** Teresa Duvall – ODU School of Cybersecurity and COVA CC



# Cybercrime To Cost The World 8 Trillion Annually In 2023

Cybersecurity Ventures predicts global cybercrime damage costs will grow by 15 percent per year over the next five years, reaching \$10.5 trillion USD annually by 2025, up from \$3 trillion USD in 2015. — Steve Morgan, founder of Cybersecurity Ventures and Editor-in-Chief at Cybercrime Magazine

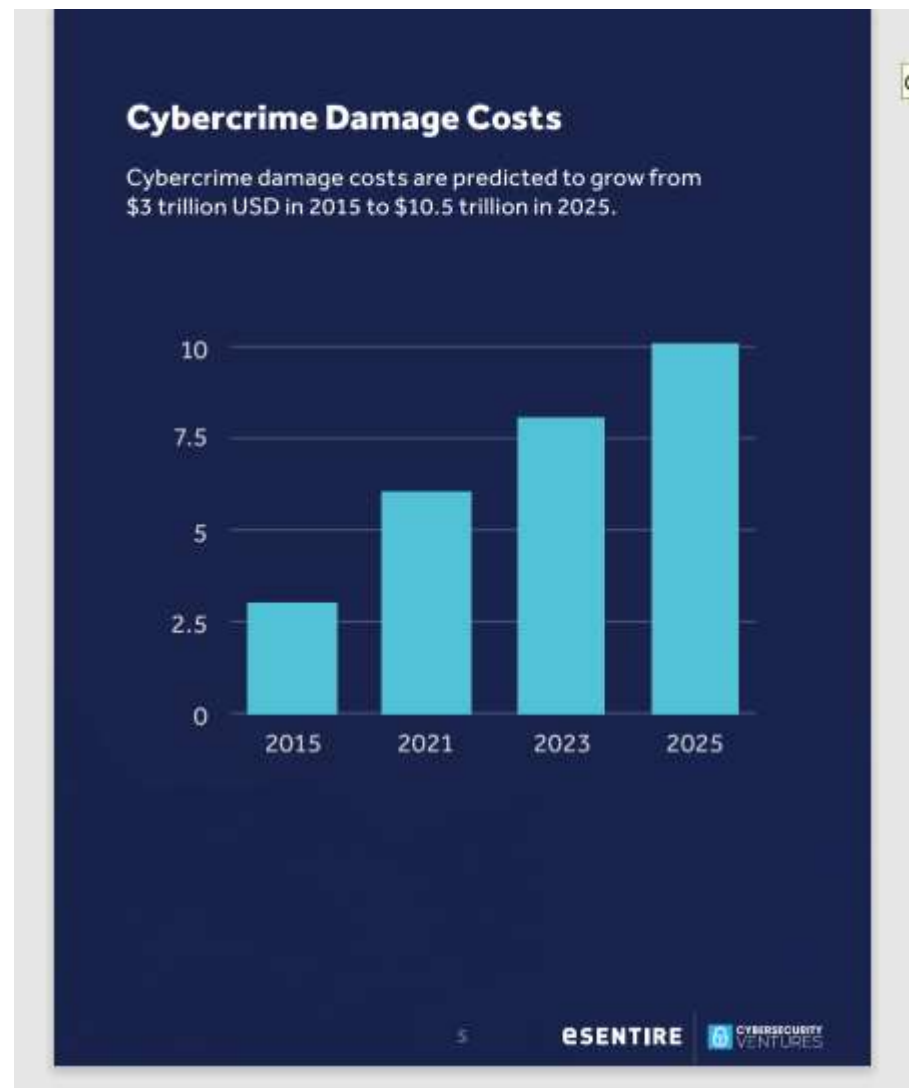
It is clear there is no endgame to cyber threats and the cost to large and small businesses

### Cybercrime,

- Denial of service,
- Identity theft,
- Malware injection,
- Social engineering,
- Advanced Persistent Threat

### Cyberattacks,

- Ransomware,
- Involve extortion of information,
- make websites unavailable
- Manipulating hardware of software



[2022-Official-Cybercrime-Report.pdf](#)

<https://threatmap.checkpoint.com/>  
Live Cyber Threat Map

# The National statistics 2023

- About a quarter of the U.S. workforce is employed in STEM occupations
- Women comprise only 25% of the cybersecurity workforce, according to research from the International Information System Security Certification Consortium, ISC2, despite outpacing men in overall college enrollment.
- Women also receive fewer bachelor's degrees in STEM fields than men

*“As we always say, representation matters, so I speak from my experience. If we don't see people that look like us in a certain field, half the time we won't pursue it.”*



# The State of Virginia gap

## Virginia

SUPPLY/DEMAND RATIO ⓘ

VIRGINIA, 2023



69% Virginia  
69% National average

TOTAL CYBERSECURITY JOB OPENINGS ⓘ

VIRGINIA, 2023

61,648



TOTAL EMPLOYED CYBERSECURITY WORKFORCE ⓘ

VIRGINIA, 2023

100,042



Shows the estimated number of workers employed in cybersecurity-related jobs from May 2022 through April 2023.

According to a report by Security Magazine, over an eight year period, confirmed the number of **unfilled cyber jobs grew over 35% from 1 million positions in 2013 to over 4 million globally in 2021** with half a million of those unfilled jobs in the U.S.

[Mission-critical: Northern Virginia sets out to solve the cybersecurity workforce shortage | 2021-05-26 | Security Magazine](#)

In 2023, Virginia had over **61K cybersecurity job openings**.

According to a [2019 \(ISC2\) Cybersecurity Workforce Study](#), 65% of organizations report a shortage of cybersecurity staff, while a lack of skilled and experienced cybersecurity personnel is the top job concern among respondents (36%). And of the candidates who are applying for these positions? [Fewer than one in four are even qualified](#), according to the MIT Technology Review.





# Discussion

- How do we attract and maintain women into the field of Cybersecurity



- How do we address the gap in numbers of women and women of color college students hired in the cybersecurity field and in a sustainable manner

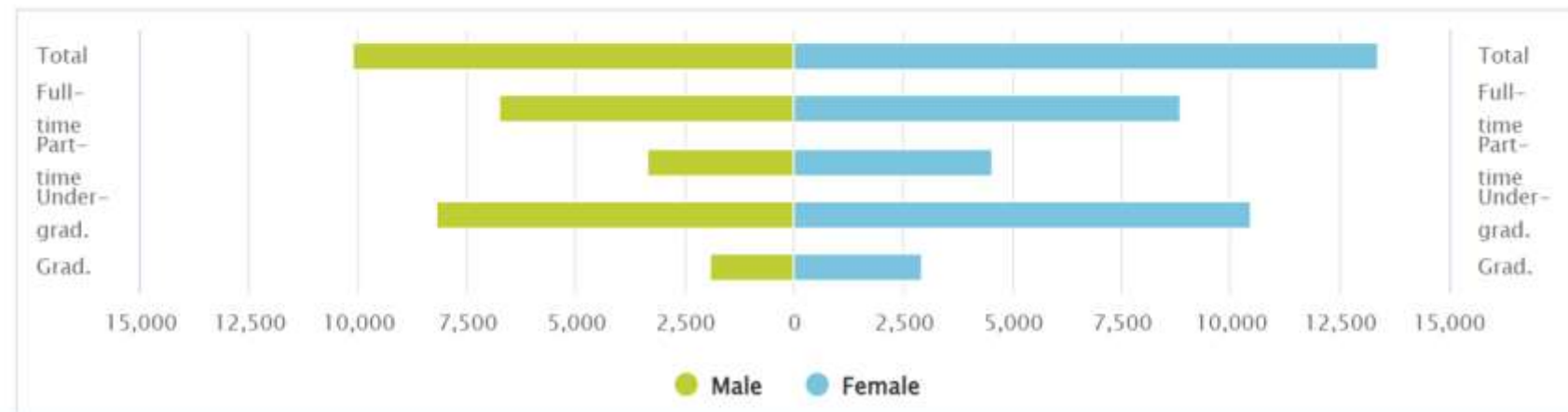
Student



# Old Dominion University by Gender

ODU has a total enrollment of 23,494 with a gender distribution of 43.01% male (10,105 students) and 56.99% female (13,389 students).

Student Population By Gender Old Dominion University			
	Total	Men	Women
Total	23,494	10,105	13,389
Undergraduate	18,678	8,207	10,471
Graduate	4,816	1,898	2,918
Full-time	15,626	6,756	8,870
Part-time	7,868	3,349	4,519

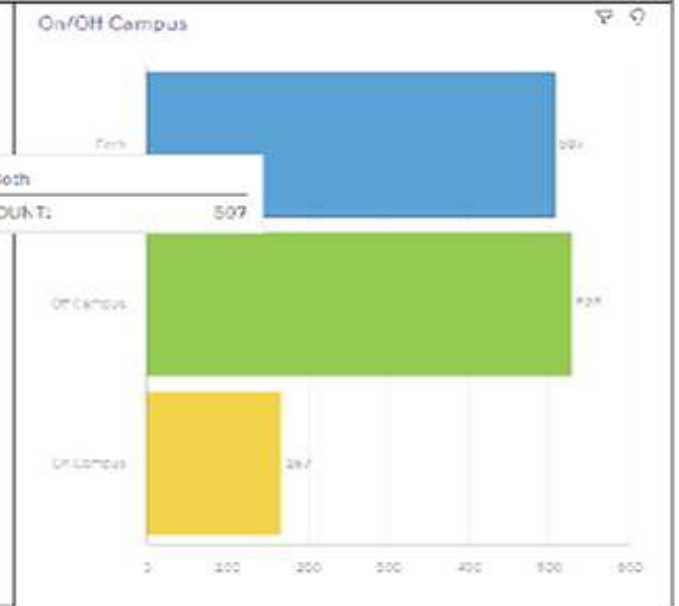
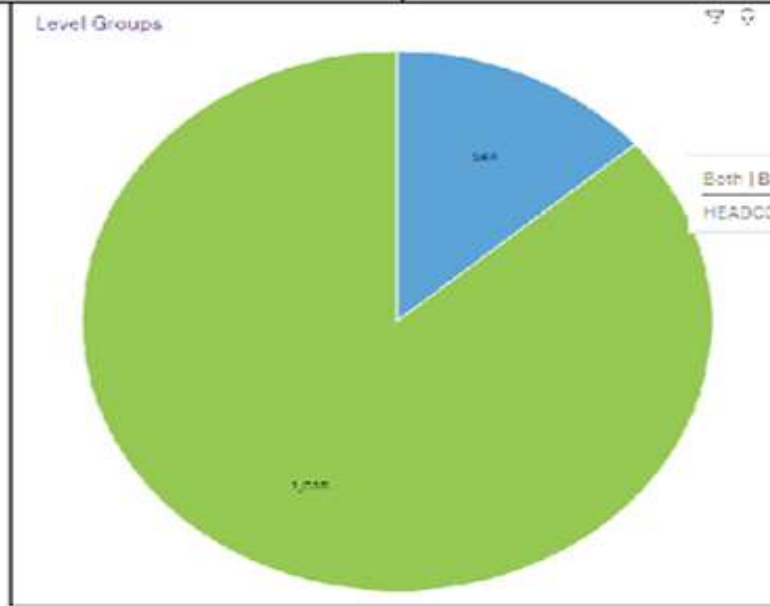
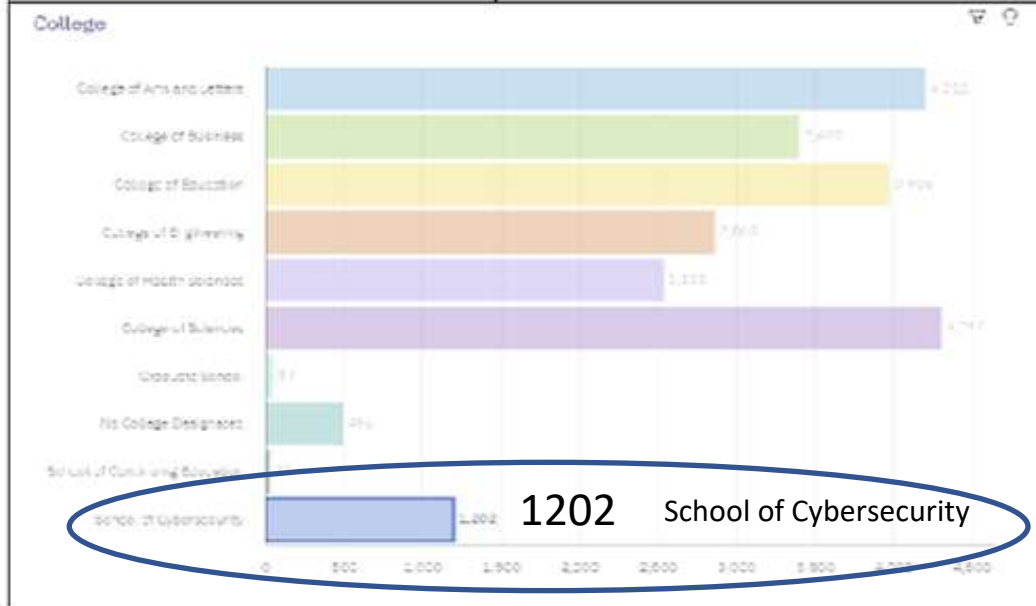
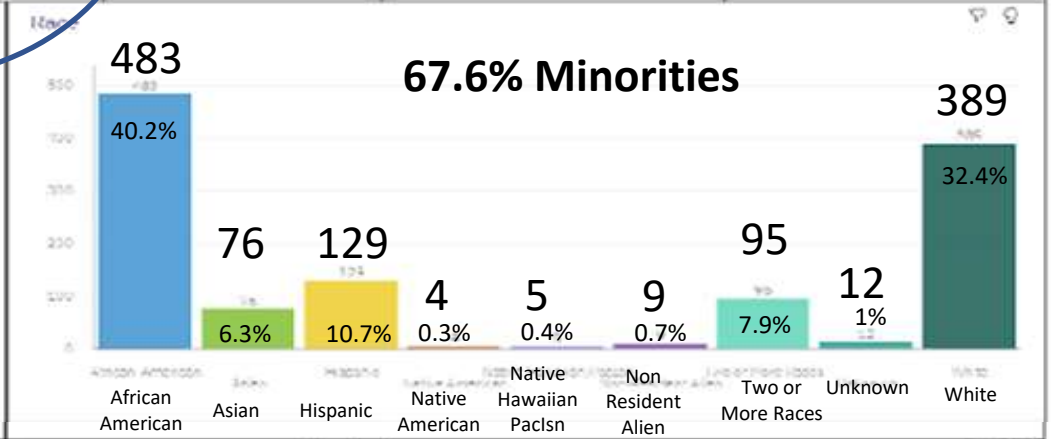
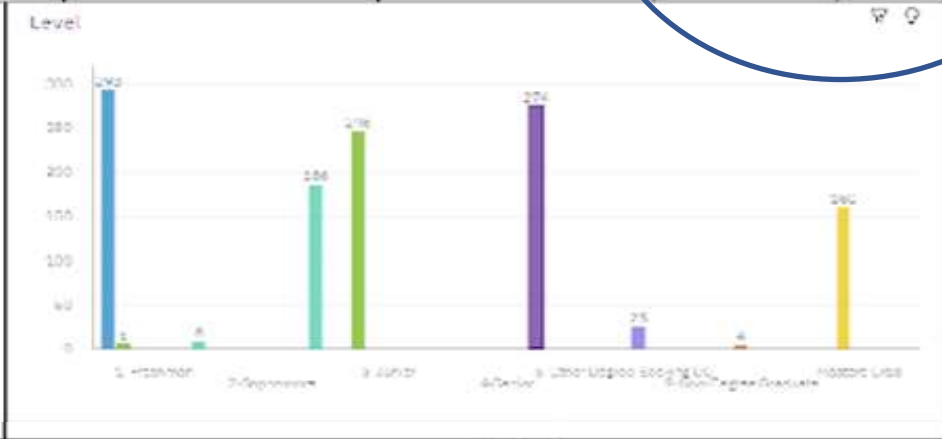
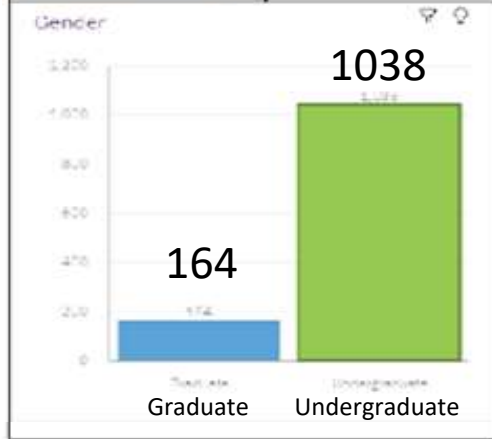


# ODU School of Cybersecurity – ODU Factbook

## Student Headcount – Fall 2022

**Gender**  
75.5% 24.5%

Term	Headcount	Undergraduate	Graduate	Male	Female	Avg Age	Full time	Part time
Fall 2021	1,202	1,038	164	907	295	25.47	929	273
Fall 2022	1,202	1,038	164	907	295	25.47	929	273





# What's wrong with this picture?

- No, not the bad glasses



# The thoughts/words 2020

“My ideas are welcomed, however can be railroaded by larger personalities and voices.”

“Those in positions of power need to advocate for diversity and demonstrate support by putting minorities and women in key positions.”

“I was told that the information technology and cyber fields were for boys; that I was not technical enough to make it”

“Women have to climb mountains and adapt just to be successful.”

# The statistics

25%

of respondents estimated that their organization has  
**1 OR FEWER WOMEN IN AN EXECUTIVE ROLE**

71%

of minority women said a  
**'GLASS CEILING' EXISTS THAT LIMITED THEIR CAREER GROWTH**

53%

estimated that their organization has  
**1 OR FEWER MINORITY EXECUTIVES**

91%

of women surveyed said  
**THEY DIDN'T FEEL LIKE THEY HAD THE SAME OPPORTUNITIES AS THEIR MALE COUNTERPARTS**



# Culture?



Women understand cyber. They understand technology. They are no less capable than men, but discrimination, a lack of awareness, and a failure to encourage the next generation to promote cybersecurity as an attractive career path all contribute to fewer women entering the field.

Charlie Osborne, Top cybersecurity journalist and author of Cybercrime Magazine's Women Know Cybersecurity 2022 Report

“I’m typically the only woman in the room, no matter what country I’m working in, what conference I’m attending. That’s the reality, the Cybersecurity profession today is still a white, middle-aged man profession.”

[DEI-Market-Research-2021.pdf](#)

“**Culture can change.** When the ‘forcing functions’ are cyber attacks on our financial systems or national security systems, we won’t be looking to see who is female or male in filling the position. We will want the best and brightest. It’s not a question of if these attacks are going to happen, but rather it is when and how often. The time to act is NOW. “ Teresa Duvall – ODU School of Cybersecurity and COVA CCI



# Don't just admire the issue – think- MISSION FIRST

- Leadership
- Assess. Needs Assessment, periodically pulse
- Institutionalize - Commit to a culture where ALL can be cyber professionals
- Recruitment, Retention, Promotions - Getting to 'yes'; getting past 'no'
- Educate /train all the time, every opportunity
- Metrics
- Resources



<https://i0.wp.com/marketbusinessnews.com/wp-content/uploads/2020/11/Thumbnail-metrics-40930939039039309.jpg?fit=760%2C565&ssl=1>

[http://quantumascendance.com/wp-content/uploads/2017/08/leadership-1959544\\_1920.jpg](http://quantumascendance.com/wp-content/uploads/2017/08/leadership-1959544_1920.jpg)





# Solution is multi-faceted

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- **Leadership** – lead from the top. Do you (leader) care? What is the priority to have women in cybersecurity? Why is it important? Who is on your team of leaders? Are you open to diverse viewpoints? Will you invest in breaking the glass ceiling where it exists?
  - Will YOU stay engaged - what does that look like?
- Needs **assessment**, periodically pulse.
  - Introspection. Where am I today? What is my end state?
- Commit to a **culture** where ALL can be cyber professionals
  - Commitment to initiative – long term
- **Recruitment, Retention, Promotion**
  - Getting to ‘yes’; getting past ‘no’ ask the ‘why’ and ‘why not’
  - It is about the mission - from company to national effect on resources and security





# Solution is multi-faceted

- **Education, Training/retraining** – from middle school, high school, college
  - Teachers, educators – it starts with you
  - Cyber is FUN – look at educational programs
  - Get involved and educated on STEM – the field is ever changing. How do you keep current?
  - Do you look for opportunities to advise, mentor, encourage, be bold!
  - Contests, summer camps! Who should take charge? A camp for girls only – cybersecurity!
  - Bring women working in a STEM field into your classroom
- **Mentorship** – not one mentor, but at several stages in education and career
  - Importance of joining organizations such as University cyber, or engineering organizations: International and local chapters including AFCEA, Women in Cybersecurity (WiCyS), Women in Technology (WIT), Women's Society of Cyberjutsu (WSC), Society of Women Engineers. And Program Management Professional (PMP)
  - Peer groups –
    - Coastal Virginia Cybersecurity Student Association (CVCSA), Closing the gap between cybersecurity students and the workforce [\(28\) Coastal Virginia Cybersecurity Student Association \(CVCSA\): About | LinkedIn](#);
    - University Chapter organizations
  - Special interest groups – e.g. Blacks in Engineering; Blacks in Government; National Society of Black Engineers



# Don't just admire the issue – take charge and move out

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- **Metrics** – how to you measure progress? Internal to your program. And collaborate with COVA CCI. Share ‘Lessons learned’ and winning strategies at every opportunity. Are you filling open cyber positions with women, women of color ?
- **Resource**
  - Address the gap through a Needs assessment when looking at making a change
  - Develop programs to bridge from the social sciences to cybersecurity
  - Develop a course in Women in Cybersecurity – bring in guest lecturers (successful women in the field) “ I want to see people like me in classes, in the workplace/field, and in leadership positions”
- **Leadership** - Change starts at the top and having role models from diverse backgrounds will instill confidence and inspire.

