

Leading the Growth of Miami's Cybersecurity Workforce



Miami Dade College (MDC) has built one of the strongest cybersecurity education pathways in the nation in record time.

The college started in 2017 with investments in faculty professional development to create a robust curriculum, and a cyber range virtual simulation environment with the most advanced security training platform available. In just three years, MDC implemented a full, stackable credential pathway that students can take from industry certifications to an associate degree to a bachelor's degree in cybersecurity. Soon after, MDC students began to compete against teams from prestigious cybersecurity institutions in national competitions, demonstrating their skills at stopping real-world cyberattacks by finishing in the top 5% as a team and in the top 1% individually. As a result of all these efforts, the National Security Agency (NSA) designated MDC as a National Center for Academic Excellence (CAE) in Cyber Defense in 2022, the first college in South Florida to receive this nationally-recognized designation.

Now with their first graduates securing and succeeding in internships and jobs, MDC is continuing to modify curriculum to the latest technologies and build industry partnerships that inform continued program development and benefit from the highly-skilled cybersecurity workforce emerging from MDC. Demand for this workforce has emerged as an urgent need in Miami largely because state-funded incentive programs and private equity firms are investing in local start-ups, catalyzing rapid growth of the cybersecurity industry. MDC is delivering that needed workforce, supporting local employers and spurring further growth in the local economy.









“Because of the Women in Cybersecurity chapter we have at MDC, I was able to attend a conference for women in cyber, meet with potential employers, and pass my resume along. I landed my first cybersecurity job because of this connection.”

— *Kennashka DeSilva, current student in the bachelor's degree program in Cybersecurity and Cloud Security Engineer*

MDC's Cybersecurity Program Components

Six key program components have emerged as critical to the success of students.

	<p>Industry-driven Curriculum. The curriculum was built from state, federal, and industry standards, and it continues to evolve with the technology, staying on the cutting edge of cybersecurity. The Business Industry Leadership Team (BILT) meets with faculty and administrators twice per year to advise on where the industry is going, what new technology is emerging, and what skills students need to learn to be successful. Faculty work to develop their own skills and revise curriculum to grow with the industry.</p>
	<p>Hands-on Learning. All of MDC's cybersecurity classes require students to practice the skills they are learning. Starting with the introductory courses, MDC is able to train students in fighting cyberattacks by breaking them down into smaller pieces. In advanced classes, students are using the Cyber Range technology to fight real-world cyberattacks that industry is currently encountering.</p>
	<p>Real-world Cyberattacks. MDC's Cybersecurity Center provides students the opportunity to defend against real-world cyberattacks. Using Cyber Range technology, students work in teams to stop attacks as quickly as possible. They develop a report on the actions they took, including an evaluation of the efficacy of their actions. This experience prepares students to enter the workforce with the technical skills to stop cyberattacks and the ability to communicate their strategy to managers or executives.</p>
	<p>Industry Certifications. Students earn industry certifications throughout the program. Faculty have embedded preparation for industry certification exams into the curriculum, MDC subsidizes the cost of the certification exams, and students complete the exams as part of their course completion. In the first three years of the program, MDC students have earned over 300 certifications.</p>
	<p>Job Search Support. MDC provides a range of services to support students in finding jobs. The campus career center helps students prepare resumes and cover letters. Faculty and administrators in the program work to make connections to jobs and internships, leveraging their networks and the networks of industry partners. MDC also supports students to attend conferences, where they have found industry mentors. These mentors have supported students in their job search by helping them to prepare for interviews and understand what companies are looking for in the hiring process.</p>
	<p>Network Development. Students have opportunities to network with each other and with the Miami cybersecurity community in classes, at conferences, at competitions, and through student-led online networks and clubs. The Cybersecurity Club and Women in Cybersecurity are student-led groups that connect students to conferences, job fairs, and competitions.</p>

MDC's Cybersecurity Programs

MDC has developed programs to support diverse student entry points and goals. Credit programs serve both high school students and degree-seeking college students. Both credit certificates and noncredit trainings support mid-career professionals looking to change careers or upskill. The noncredit program is customizable by individual and company needs. All programs are offered online and in-person at multiple MDC locations.

SUMMER BOOTCAMP	A.S. CYBERSECURITY	B.S. CYBERSECURITY	NONCREDIT TRAINING
High school students	MDC students	MDC students	Mid-career professionals & company employee groups
1 week	2 years	4 years	Embedded certifications
Certification preparation	Embedded certifications	Embedded certifications	Embedded certifications
		Cyber Range	Cyber Range

Engaging Students Beyond the Classroom

Current students have developed a cybersecurity club where MDC students participate in national competitions with top colleges and universities, and they are coming out as top competitors. “We participated in the National Cyber League competition with over 900 other colleges and universities and came out in the top 5% as a community college. That was unheard of. We are a community college competing against bigger universities with more resources,” says DeSilva.

Students have also developed online networks where they support each other in internship and job searches. One is a Discord channel with over 400 MDC students. Another, Black Women in Cyber, was founded by two MDC students and is now expanding beyond MDC. DeSilva spoke about this virtual network, “Our primary goal overall is to empower other women because we don’t want to be there at the top by ourselves. I want to look around and see other Black women.”



“The turning point in the program for me was in the cybersecurity community. We are constantly connected to resources and professors often bring in speakers from their networks.”

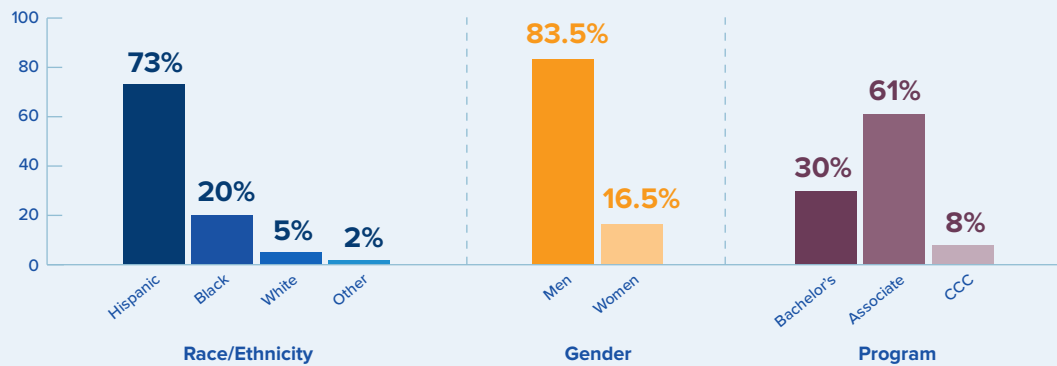
— Ievgeniia Ieromenko, former MDC student and AWS ProServe Consultant Intern



Through the MDC clubs, students are participating in competitions, hackathons, and more. They are supporting each other as they navigate the college system, the industry certifications, and the career path, connecting each other to resources and people. Graduates are now entering into paid internships with companies that feel fortunate to have access to new talent.

MDC Cybersecurity at a Glance

MDC Cybersecurity Students, Fall 2021



Companies Providing Jobs and Internships

- Accenture
- Amazon
- Assurant
- AT&T
- AWS
- BlackBerry
- Caterpillar Inc
- City National Bank
- EY
- Federal Aviation Administration
- InfoSight
- Intel
- Lumu Technologies
- Silicon Technology Solutions, Inc
- Slalom

Job Titles Earned by MDC Students

- Career Lead, CyberSecurity
- Cloud Operations Analyst
- Cloud Support Engineer
- Cybersecurity Analyst
- Help Desk Support Specialist
- IT Analyst
- IT Engineer
- IT Operation Analyst
- IT Manager
- Junior Software Development
- Penetration Tester
- Security Consulting Analyst
- Service Desk Team Lead
- SOC Analyst
- Technical Support Analyst



“Hiring skilled students who are still learning and growing in the field is the best way to grow my workforce.”

— Ricardo Villadiego, Founder and CEO of Lumu Technologies

Developing Industry-aligned Programs

The rapid success of MDC's cybersecurity programs stems from a tight focus on making the curriculum most impactful by incorporating the latest government and industry standards. MDC faculty and administrators worked closely with local Miami cybersecurity professionals to identify skills needed in the industry, along with those identified in state and federal cybersecurity frameworks. Development of MDC's cybersecurity programs centered on five key areas:

- 1 Industry advisory board.** MDC worked with local cybersecurity industry leaders to develop an industry advisory board known as the Business Industry Leadership Team (BILT) made up of CEOs and leaders from both large and small cybersecurity employers that guided them in what students needed to know to be successful in cybersecurity jobs.
- 2 Industry certifications.** Faculty embedded skills needed for students to succeed in industry certification exams. Many courses include these exams as part of the curriculum to encourage students to obtain certifications as they progress through the cybersecurity programs.
- 3 Center for Academic Excellence Knowledge Units.** MDC faculty redesigned and developed courses that incorporated the NSA's CAE knowledge units (KUs). The KUs are critical to meeting the accreditation standards of the NSA's CAE.
- 4 State framework.** MDC developed the programs to train students in the state of Florida's cybersecurity frameworks, which outlines local cybersecurity standards and requirements.
- 5 Professional development.** As faculty were developing the curriculum, they worked toward earning their own cybersecurity certifications. Faculty embedded the skills and technology they learned into the curriculum. Through ongoing professional development, faculty ensure the program evolves with the technology and industry.



"I want to help the community progress."

— *Diego Tibaquirá, Professor of Computer Science and MDC cybersecurity faculty lead*

Beyond setting out to achieve the NSA's CAE designation, MDC wanted students to be able to participate in hands-on learning with real-world attack simulations. While the faculty were updating their skills and earning the latest industry certifications, MDC administrators were developing a cybersecurity center where students could participate in stopping real-world cyberattacks. The center now operates as both a physical and virtual cybersecurity space where students gain hands-on experience in a cyber range. The cyber range allows instructors to unleash the same attacks faced by other organizations, forcing students to use tools and techniques to detect, respond, and remediate incidents in real time.

MDC is also bringing the best practices in cybersecurity education from other countries to Miami. Recently, a team of faculty, administrators, and a student traveled to a conference in Israel where they learned about the latest technology and approaches to mitigating cyberattacks from global leaders in cybersecurity.

A Growing Cybersecurity Hub

MDC's program faculty look to industry for guidance on keeping their curriculum cutting-edge. Their relationship with the local cybersecurity industry community is key to keeping curriculum updated and ensuring students are prepared for the workforce.



“MDC’s BILT makes sure that the program reflects the needs of the market; that the program incorporates the skills the new generation of cybersecurity analysts need to be effective in the market.”

— *Adonis Sardiñas, Cybersecurity Systems Engineer at Fortinet and MDC BILT Member*

Local employers are seeing the benefits: “As an entrepreneur, I understand the lack of talent that the state has in terms of cybersecurity. MDC has created the connection between education and leading cybersecurity companies in Miami, providing me access to the new talent I need,” says Villadiego.

MDC alumnus Manny Medina, Founder and Managing Partner of Medina Capital, a leading equity firm investing in cybersecurity in Miami, states, “The development of this program in Miami is phenomenal for the college, for the students, and for the city itself. We are creating a diverse workforce, offering opportunities in cybersecurity that many MDC students never would have considered previously.” Leveraging Medina’s consortium of cybersecurity companies as partners in developing local cybersecurity talent, MDC has become an educational leader supporting the sustainability of the cybersecurity boom that is taking off in Miami.



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What makes this technology boom stand out? The commitment to the community and to growing local talent. “I owe everything to Miami Dade College,” Medina states. As an MDC alumnus, he is committed to reaching out to the largely immigrant community of Miami and opening doors to cybersecurity careers. Other industry representatives and MDC faculty, administrators, and students share Medina’s desire to advance opportunities in cybersecurity. “I want to help the community progress,” states Diego Tibaquirá, Professor of Computer Science and MDC cybersecurity faculty lead. This commitment leads to life-changing opportunities for students as they move from community college to high-wage, high-growth jobs.



“Our students graduate with a baccalaureate degree in cybersecurity; they have their industry certifications and the hands-on skills; they’re prepared and ready to succeed in the workforce.”

— Manny Perez, MDC Dean of Engineering, Technology, and Design

As MDC continues to graduate highly skilled students equipped with industry certifications and real-world cybersecurity experience, Miami and its growing cybersecurity community are thriving. MDC faculty and administrators work to keep the curriculum cutting-edge and increase internship and job placement opportunities for students. Students are gaining in-demand jobs in high-growth career paths. And cybersecurity employers are accessing new talent skilled in the latest technology and ready to learn and grow with the industry. As technology expands into areas such as artificial intelligence and driverless cars, cybersecurity needs will continue to grow and expand. MDC is ready to train the workforce needed to protect these new technologies from cyberattacks. Manny Perez, Dean of Engineering, Technology, and Design sums it up: “Our students graduate with a baccalaureate degree in cybersecurity; they have their industry certifications and the hands-on skills; they’re ready to go.”



For more information, visit
<https://www.mdc.edu/cybersecurity>

