



Building a Cybersecurity Workforce



Jennifer Oddo leads IBM's external apprenticeship initiatives where she is responsible for advocacy, education and enablement of strategic initiatives and partnerships.

Ms. Oddo was also part of the team to launch IBM's inaugural apprenticeship program where she was responsible strategy, design and delivery of competency models, work-based learning and business unit deployment. She also leads the design and deployment of IBM's newly launched pre-apprenticeship program.

Ms. Oddo resides in Cleveland, OH. She currently serves as Co-Chair of the Consumer Technology Association Apprenticeship Coalition, Vice Chair and Executive Board Member on the Ohio State Apprenticeship Council and TeamNeo (JobsOhio Network Partner) Talent Development Council.

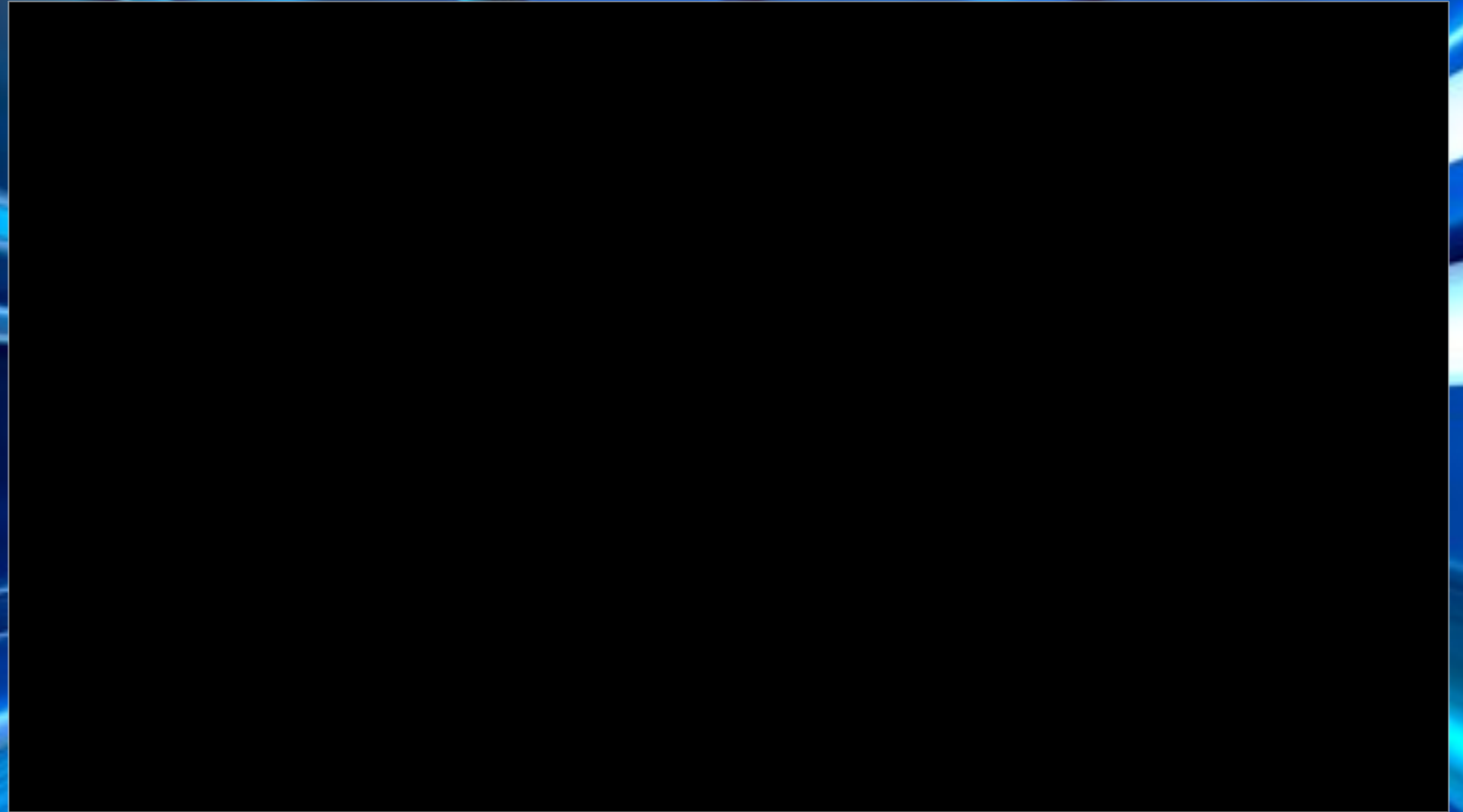


Let's talk cyber skills and workforce

- Will cybersecurity remain an essential in-demand skill?
- What is Apprenticeship and how is IBM leveraging this as a workforce strategy?
- How do we create opportunity and access through Pre-apprenticeship?
- What can companies do today to prepare?
- Questions

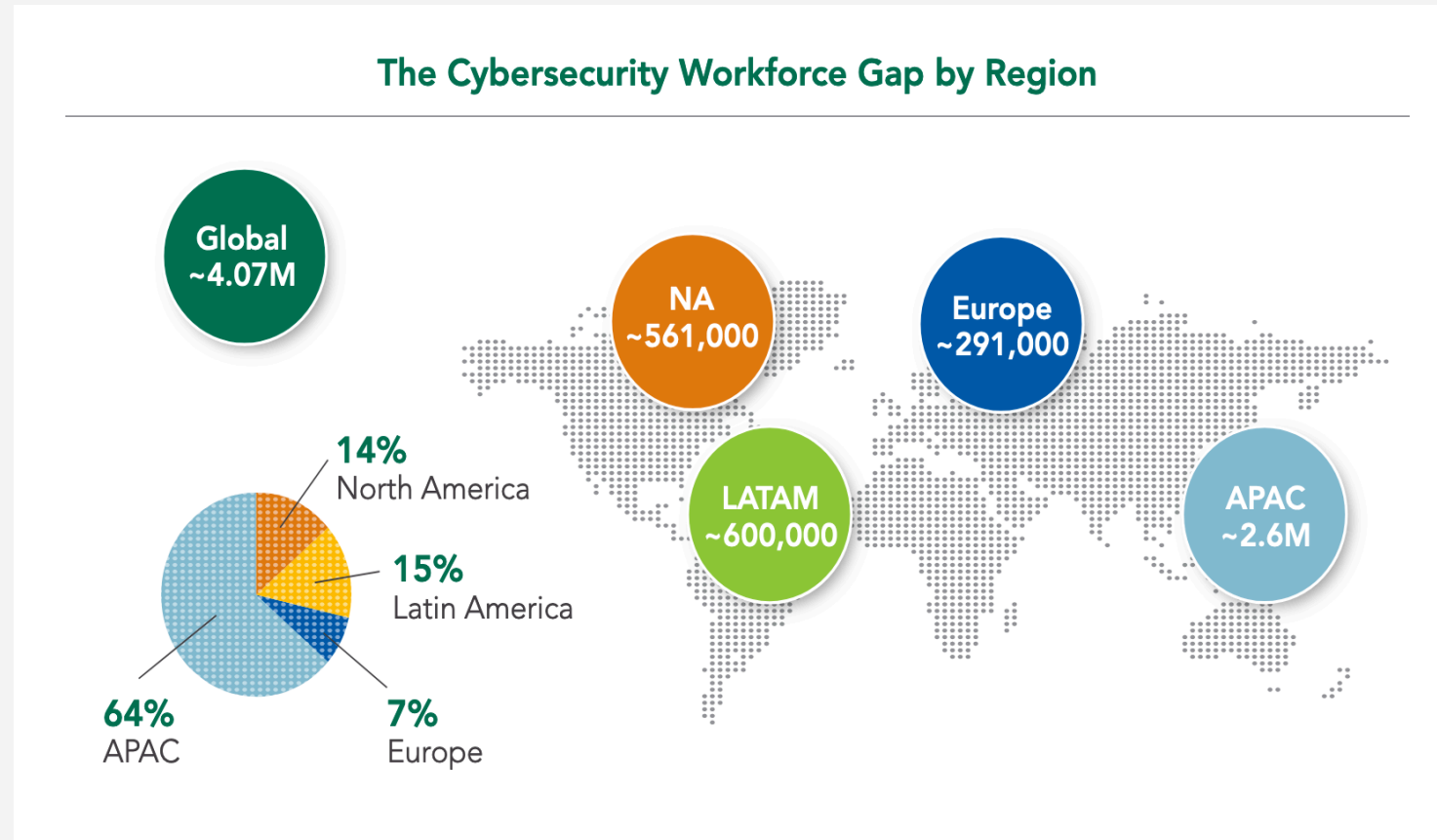
Meet Brandon

*IBM Cybersecurity
Apprentice*



(ISC)2 Cybersecurity Workforce Study, 2019

(ISC)² Finds the Cybersecurity Workforce Needs to Grow 145% to Close Skills Gap and Better Defend Organizations Worldwide



2020 Statement

In a time of extreme digitization and automation, cybersecurity will remain an essential in-demand skill. This is now a time where industry needs to prepare the American workforce with the essential skills for the new era of digital and AI. Leveraging New Collar programs like apprenticeships will be a key strategy to our future of work. –Jennifer Oddo, IBM Apprenticeship Initiatives

World Economic Forum Publication; How COVID-19 shows the urgent need to address the cyber poverty gap

“At this time of unprecedented reliance on digital services, infrastructure and the need for reliable information, cybersecurity has never been more important. While most of society sees the pandemic as a time for collective action, criminals have launched spear-phishing attacks imitating the WHO and Centers for Disease Control and Prevention (CDC), ultimately using the context of the pandemic [to spread malware and ransomware](#) as well as launch fraudulent websites that prey on users intent on helping others.”

<https://www.weforum.org/agenda/2020/03/covid-19-pandemic-shows-the-urgency-for-addressing-the-cyber-poverty-gap/>

The Future of Work is **New Collar**

New collar is about **skills, not just degrees**.

- The era of digital and AI is expected to change 100% of jobs in some way
- The traditional education system cannot keep up with the rapid pace of change.
- The skills needed by our future workforce are changing rapidly and IT skills are becoming perishable with a shorter shelf life.
- We need to think differently about how to prepare the workforce of tomorrow.
- The responsibility has shifted to companies to begin to train workers internally.

“Let’s work together to scale up this approach of vocational training, creating a national corps of skilled workers trained to take the “new collar” IT jobs that are in demand here in America. ”

~ Ginni Rometty
Chairman, President, and CEO, IBM



The Future of Work

The skills gap is now a national imperative and business leaders must prioritize their future of work strategies to help advance America's economy, our people and our great innovations. Without these new approaches to finding and developing talent, companies simply can't and won't compete.

IBM realizes that **the skills challenge is bigger than any one company can solve**; and, to gain wider industry adoption and create **“workforce velocity”** at scale, we have to cast a wider net giving everyone the opportunity to participate.

Additionally, the workforce model is rapidly changing at a time where business, government, higher education, not for profits all have to come together as one to solve the skills gap issues.
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IBM has been working not only to develop our own internal programs, but giving back to the communities we serve through coalitions and partnerships like:

- [CTA Apprenticeship Coalition](#)
- [YSU IT Workforce Accelerator](#)
- [California State Government](#)

IBM Apprenticeship Program

When IBM launched its New Collar Initiative in 2017, we were focused on creating new pathways to employment for non-traditional candidates that may not have advanced degrees in IT related fields.

Apprenticeship seemed like an ideal starting point due to its historical success in other industries. The rapid program growth of our program has indeed demonstrated the value as a strategic solution to creating a diversified talent pipeline. But to drive larger scale change, industry needs more companies to exemplify and amplify their leadership in adopting these talent models.

In 2020, we are further advancing our program to deliver a pre-apprenticeship training program to strategic partners. This program will help ready those with foundational and workforce ready skills needed for entry into an apprenticeship program.



IBM

Apprenticeship Offerings

- + Software Engineer/Application Developer
- + Cyber Security
- + Network Administrator
- + Computer/IT Support
- + Mainframe System Administrator
- + Data Scientist
- + Data Analyst
- + Chemical Technician
- + Electronics Technician
- + Human Resources
- + Marketing
- + Hardware Design Technician
- + Technical Solution Specialist
- + Technical Solution Seller
- + Project Manager
- + UX Designer
- + Visual Designer
- + Visual Researcher
- + IT Specialist
- + Hardware Hacker
- + Cloud Application Support

Apprenticeship

What is it? What are the benefits? How do I get started?

Why Apprenticeship?

Apprenticeship is one of the most successful types of workforce development initiatives and can help revitalize the U.S. workforce nationwide by providing access to training and employment opportunities for those who may not advanced degrees in IT.

Apprenticeship programs open up opportunity and access to those who are often looked in the industry, including community colleges, veterans, high school graduates, career re-inventors, NGO's and other under-represented communities.

Benefits for Business

- Ability to create workforce-ready pipeline
- Increased retention and engagement
- Increased productivity and knowledge transfer
- Greater opportunity and access to those in under-represented communities
- Ability to train for skills needed
- Access to federal and state training and wage offsets

Benefits for Workers

- Ability to learn relevant industry skills
- Earn while you learn
- Nationally recognized credential
- Industry recognized credentials and certifications
- Career Advancement
- Greater pathway to employability
- Access to a dedicated mentor to help accelerate the development of skills

What is **Apprenticeship**?

- + An apprenticeship is an experiential “earn while you learn” program that blends on-the-job learning with on-the-job training to build foundational skills needed for a specific occupation. In apprenticeship, we hire for aptitude and train for skills.
- + Apprenticeship is often referred to as the “gold standard” of work-based learning, given the robustness of learning and hands-on experiences, and direct connections to employment.

+ Apprenticeships can be flexible using one of three training approaches:



Time Based: Time based training measures skill acquisition through the individual apprentice's completion of at least 2,000 hours of on-the-job learning as described in a work process schedule



Competency Based: Competency based measures skill acquisition through the individual apprentice's successful demonstration of acquired skills and knowledge, as verified by the program sponsor



Hybrid: Hybrid measures the individual apprentice's skill acquisition through a combination of specified minimum number of hours of on-the-job learning and the successful demonstration of competency as described in a work process schedule

What is **Apprenticeship**?

- + Apprenticeship is much different than your traditional internship or co-op program in that:
 - Active educational enrollment or attainment of a degree is not a pre-requisite for participation.
 - Program duration is significantly longer, no shorter than 2000 concurrent hours of paid on-the-job training, whereas internships are typically 8-12 weeks in length.
 - Apprenticeship requires a structured approach to both related technical instruction (RTI), in addition to on-the-job training.
 - Apprentices must master the competencies as outlined in the occupational standards as a condition of graduation from the program.

The IBM Apprentice Experience



Key Components of an Apprenticeship Program



IBM Approach



Competency Based: Competency based measures skill acquisition through the individual apprentice's successful demonstration of acquired skills and knowledge, as verified by the program

IBM chose to develop a competency-based apprenticeship program because it provided us with the most flexibility for our goals. Given the rapid pace of technological change, we didn't want to specify time limits since it could have hindered the adoption. Additionally, it just didn't feel as contemporary. The competency-based model has proven very successful for us because:

Apprentices have clear expectations about what they need to master. It provides flexibility to progress at one's own pace and potentially complete the program early. It also required us to think strategically about the desired outcomes of a fully proficient apprentice, which yielded a more robust program.

Competency Based Standards

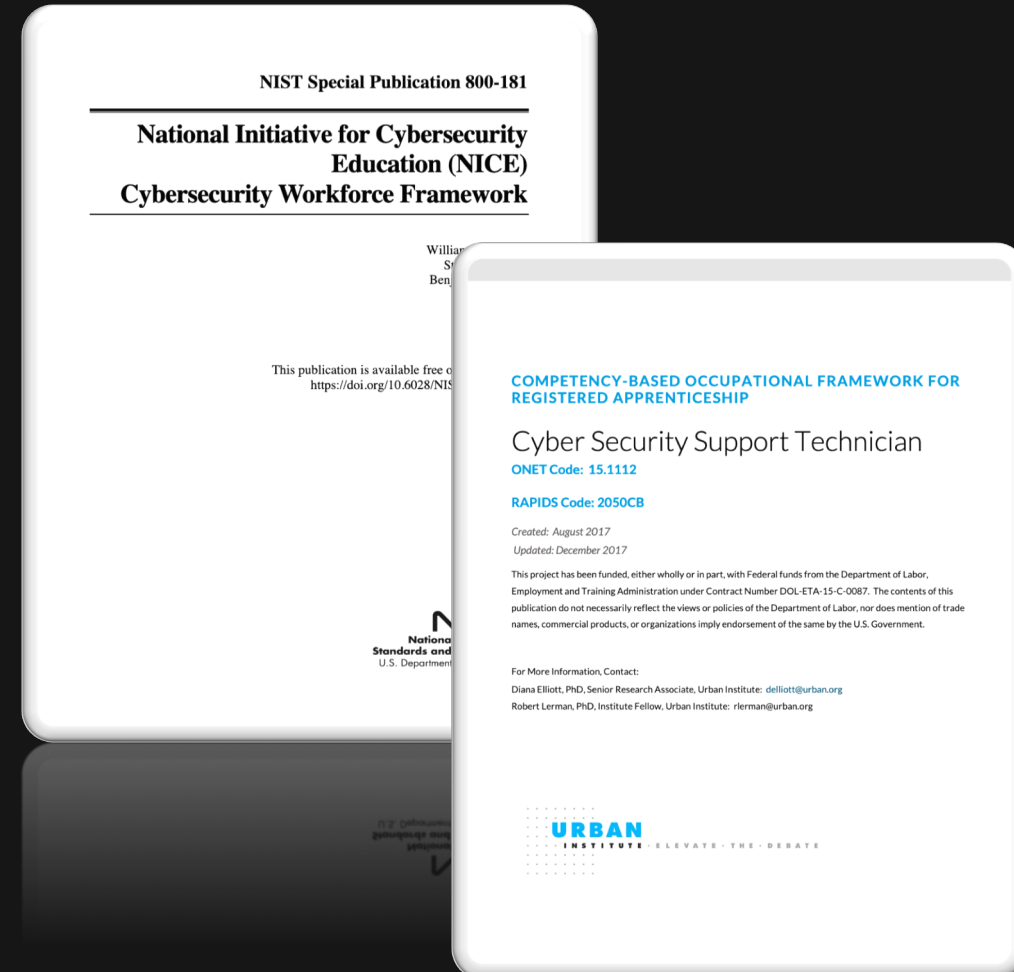
+ Your competency standards will become the roadmap to your apprenticeship programs and will guide all learning, training and other activities to manage the program and the experience.

+ Tools to help you create your framework:

- [Competency Model Clearinghouse](#)
- [SHRM Job Analysis Toolkit](#)

+ Existing Frameworks

- [IBM Cybersecurity Analyst Framework](#)
- [NICE Cybersecurity Workforce Framework](#)
- [Urban Institute Competency Frameworks \(DOL Commissioned\)](#)



Grant Funding and Wage Offsets

- The U.S. Department of Labor (DOL) has invested over \$300 million since to expand apprenticeships.
- Businesses that participate may be eligible to defray their program costs through state tax credits, Workforce Innovation and Opportunity Act (WIOA) funds as well as other government incentives.
 - Over \$1 billion for employment and training services is available through Workforce Innovation and Opportunity Act programs across the country. These programs can provide training funds to support on-the-job training and related instruction, as well as provide supportive services to help apprentices.
 - Local Workforce Investment Boards (WIB) can provide an offset to wages of up to 50% for on-the-job training (OJT) for WIOA eligible apprenticeship participants.
- Public/Private partnerships grants such as USDOL H-1B funded grants can provide cost offsets to training and offset some apprenticeship wages.
- Veteran New GI benefits can be used by the Veteran to offset some training/education costs.

Creating Organizational Buy-in

- + **Technology:** Adapting to change, staying relevant with new products and services, and understanding data insights are emerging as the top-of-mind issues with business leaders.
- + **ROI:** C-Suite remains acutely focused on profitability, agility and competitive positioning at a time when technology advancements are emerging at speed and scale.
- + **Human Capital:** Talent supply, employee engagement, productivity gains, and skills currency have emerged as critical challenges facing corporate America.
- + **Corporate Brand Reputation:** Finally, we discovered that company branding, as a desirable place to work through its social responsibility efforts, diversity and inclusion programs, and company culture is an essential component for maintaining competitive relevance.

Actions

- Understand your stakeholders and what is keeping them up at night
- Set up executive roundtable to educate and assess interest
- Build use cases with real world opportunity and industry insights



Partnership to Advance Youth Apprenticeship

***Multi-stakeholder initiative led by New
America***

+ Grant Recipients

- Apprenticeship 502 (Louisville, KY)
- ApprenticeshipNC (Raleigh, NC)
- The Birmingham Promise (Birmingham, AL)
- Career Launch Chicago (Chicago, IL)
- Early Care and Education Youth Apprenticeship (Oakland, CA)
- King County Regional Youth Apprenticeship Consortium (Renton, WA)
- Montana Youth Apprenticeship Partnership (Helena, MT)
- Texas Youth Apprenticeship Program (Austin, TX)
- PPL Learn and Earn to Achieve Potential (LEAP) Initiative (Minneapolis, MN)

Pre-apprenticeship

What is pre-apprenticeship? Why is it important?

How can I get started?

What is a Pre-Apprenticeship?

Pre-apprenticeship is a structured training programs designed to prepare individuals without any prior knowledge or experience with the minimum professional and technical skills needed for consideration into a registered apprenticeship program.

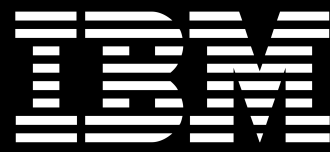
Key Components of a Quality Pre-apprenticeship Program

- ✓ Aptitude assessment
- ✓ Alignment to in-demand employer skills
- ✓ Industry-recognized credentials
- ✓ Hands-on learning activities
- ✓ Wraparound support services
- ✓ Transition into a registered apprenticeship

Why Are Pre-Apprenticeships Important to the Future of Work?

- Pre-apprenticeship creates confidence and capabilities for those that may not have the pathway to higher education.
- We need to do more to create opportunity and access for everyone in the era of digital and AI.
- Educational systems cannot keep up with rapid change, nor do they always understand what industry needs.
- Pre-apprenticeship offers a solution by partnering with universities, community colleges and high schools to offer “supplemental” learning pathways to ready students into in-demand jobs.





IT Pre-apprenticeship Program

Through the USDOL Scaling Apprenticeship grant, San Jacinto Community College along with its community college consortium will be offering IBM IT pre-apprenticeship program.

The IBM IT Pre-apprenticeship Program is a training program designed to prepare individuals without any prior knowledge or experience with the minimum professional and technical skills needed for consideration into a registered IT apprenticeship program.

Through an online self-paced learning journey, students will earn digital badges to demonstrate important soft skills like teamwork, communication, and problem-solving. Additionally, they will learn new ways of working with Agile and Design Thinking. Lastly, they will build technical foundational knowledge around in-demand skills.

Each program contains curated learning, skills labs, assessments and digital badges. Upon successful completion each student will receive a certificate of completion and be eligible to apply to any IBM or other apprenticeship job opening.

IBM Pre-apprenticeship Digital Credentials



Pre-Apprenticeship User Experience



1: Take the free assessment.

Spend 50 minutes and discover the careers you will love!

[MyInnerGenius](#) is a career companion designed to help you find careers in IT that fit your natural skills, abilities and personality. There is no studying involved. Regardless of your education or background, these assessments will help you find a role where you have the best chance to be successful now and in the future. Assessment is required for consideration into the training program.

2: Start your Pre-Apprenticeship learning.

Take the first step to learn in-demand industry skills

Once you have successfully completed the MyInnerGenius assessment, you will receive a notification if you have been accepted into the IBM pre-apprenticeship program. Enrollment is limited and based on assessment results.

3: Earn your credentials.

As part of your learning, you will earn industry credentials to validate attainment of new skills.

Design Thinking Badge
Agile Explorer Badge
New Collar Professional Skills Badge
Role Specific Technical Skills Badge
IBM Pre-Apprenticeship Program Certificate

4: Explore apprenticeship jobs.

Earn your certificate and apply to apprenticeship jobs.

Visit [IBM Jobs](#) to learn more about the opportunities available at IBM



Cybersecurity Pre-apprenticeship Program

The Cybersecurity Pre-apprenticeship at IBM is designed to teach students the foundational skills needed to succeed in the workforce. The program is designed to create confidence and capability for those who have not had previous exposure to the field of Cybersecurity. This self-paced training program is approximately 70 hours long. Through the completion of this program, students will have successfully demonstrated comprehension in the following skills:

Cybersecurity Fundamentals

- Learn the history, types, and motives of cyberattacks to understand current threats to organizations and individuals
- Demonstrate understanding of key cybersecurity terminology, system concepts, and tools
- Learn about organizations and resources to further research cybersecurity issues in the modern era

Professional Skills

- Develop skills and behaviors to successfully create and deliver presentations
- Organize and build slide decks that will deliver more effective presentations
- Solve problems and implement solutions more efficiently using creative and critical thinking

Design Thinking and Agile Practices

- Learn the basic design thinking skills including collaboration, synthesis, design research, prototyping, and storytelling
- Understand foundational agile concepts and initiate the conversation with other

The Cybersecurity Pre-apprenticeship Professional Certificate is issued automatically after the successful completion of the program. For questions about this program reach out to preappre@us.ibm.com.



Actionable Strategies for building a cyber workforce

Actionable Strategies for building a Cyber Workforce

1:

WIDEN THE APERTURE

Widen the aperture of candidate pipelines by adopting New Collar principles (e.g., stop making degrees a mandatory requirement for jobs).

2:

CHANGE POSTINGS

Revitalize job postings to be engaging and to focus on the core requirements; don't "over-spec" the requirements.

3:

CONSISTENCY

Simplify career models and build transparency; leverage the National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework where possible for consistency.

4:

SHIFT SOURCING

Think about new ways of hiring and training, where the adjacent technical and professional skills take priority, and cybersecurity skills can be taught.

5:

APPRENTICESHIPS

Launch apprenticeship programs to train candidate pipelines at scale.

6:

EMPLOYEE DEVELOPMENT

Commit to employee development – support expanded and focused training in general.

7:

PARTNER

Adopt key principles for productive partnerships and programs – maximize impact by partnering with a focus on scale.

8:

SCALE

Make cybersecurity everyone's business – continue to advocate and make cybersecurity education widely available.

Principles for Growing and Sustaining the Nation's Cybersecurity Workforce

November 2018



ASPEN CYBERSECURITY GROUP
THE ASPEN INSTITUTE

For additional resources, visit: <http://aspencyberworkforce.mybluemix.net/index.html>

