



Apprenticeships for Tech
Source & Grow Talent

Getting Started with Apprenticeships for Tech



Advancing Evidence.
Improving Lives.

We are excited you're exploring apprenticeship.

Whether you're a **business** needing a pipeline of skilled workers, an **education provider** looking to bring work-based learning to your students, or a **business-member organization** working to improve the local tech labor market for your members, apprenticeship is a proven path to success for both employers and apprentices. Apprenticeship is an industry-driven, high-quality career pathway where employers can develop and prepare their future workforce and individuals can obtain paid work experience, classroom instruction, and a portable, nationally-recognized credential.

American Institutes for Research (AIR) launched *Apprenticeships for Tech* to expand Registered Apprenticeship Programs in technology occupations and increase the tech talent pool for employers across the country.

Apprenticeships for Tech is founded on five initial target occupations that are in-demand across industry sectors, with more occupations to be added over time:

- Tech Support Specialist
- Network Support Specialist
- Cybersecurity Support Technician
- Data Analyst
- Tech Project Coordinator

This guide is designed to make it easy for businesses and partners to understand how to get started to quickly implement apprenticeship as a talent development strategy. We invite you to:

- **Partner with us** – Learn how we can help you design and launch a tech apprenticeship.
- **Commit to apprenticeship** – Review the case for apprenticeship as a solution for filling open jobs.
- **Harness the power of *Apprenticeships for Tech*** – Explore our approach to accelerating program launch.

PARTNER WITH US

We are here to help you build an apprenticeship.

AIR brings deep expertise, networks, and capacity to the table, and because the startup of *Apprenticeships for Tech* is federally funded, we are able to partner and provide this program development support at no cost to you. We can also use our expertise to help you tap into potential funding from federal or state programs to off-set costs associated with developing and operating a Registered Apprenticeship Program.

The process of launching an apprenticeship program effectively can feel daunting; but our goal is to do whatever we can to streamline and expedite this process for you. Key among our efforts has been the establishment of National Guideline Standards approved by the U.S. Department of Labor. These standards can dramatically simplify the program development process, including registration. As these standards are deployed in programs throughout the country, the completion of an apprenticeship tied to them will be a more recognizable credential.

Questions or interested in learning more?
[Visit our website.](#)

We seek to partner with organizations that share the same passion for expanding tech talent by developing new apprenticeship programs, such as:

- Employers in any industry seeking sustainable solutions for a diverse pipeline of tech workers.
- Education and Training Providers working with employers to build a robust pool of tech talent.
- Workforce Providers supporting the recruitment and career preparation of job seekers for tech careers.
- Business-Member Associations looking to coalesce and support members to develop a more robust and sustainable local tech talent labor market.
- Non-Profit and Philanthropic Organizations helping their clients who aim to enter tech careers.

We provide a simple and clear approach to developing apprenticeship programs for tech occupations in any industry, which includes:

- An accelerated design process that uses CompTIA's National Guideline Standards.
- Facilitated connections to state and local resources through AIR's national network.
- Supported registration of programs that partner with state apprenticeship offices.
- Well-crafted strategies to recruit and place a diverse pool of apprentices.

The benefits of partnering with us include:

For employers, the benefits of partnering with us include:	For partners such as education and training providers, workforce organizations, business-member associations, and non-profit and philanthropic organizations, the benefits include:
<ul style="list-style-type: none">• Navigating the choices to find the right apprenticeship approach for your organization.• Hiring apprentices through one or more of our many intermediaries (group sponsors).• Accessing expert consulting to design and build your own apprenticeship program.• Developing strategies for recruitment from diverse talent pools.• Supporting federal and/or state registration using CompTIA's National Guideline Standards.• Making connections to training providers and other state or local resources.• Joining a network of participating organizations to connect to peers, information, and ideas.	<ul style="list-style-type: none">• Business engagement support leveraging AIR's Hire Ready Network.• Utilization of CompTIA's National Guideline Standards to accelerate and scale new program development.• Technical assistance to support your organization in becoming a sponsoring intermediary.• Access to expert consulting to help you develop strategies for braided funding and to advance alignment to better serve local businesses.

COMMIT TO APPRENTICESHIP

We are true believers in apprenticeship.

For individuals, we've seen how this "earn and learn" model provides people with opportunities for new jobs, increased skills, and higher pay. For businesses, we've seen how apprenticeship is a cost-effective recruitment and training strategy that builds employee satisfaction and loyalty. Apprenticeship is a proven win-win for both the employer and the apprentice.

Highly skilled tech talent is needed to accelerate growth in every industry, and it's critical this talent reflects the diversity of our workforce today. Apprenticeships provide promising pathways for job seekers from diverse backgrounds. Many people learn most effectively by doing, and many need to earn while they learn. By providing the skills and experience needed to secure well-paying jobs, apprenticeships boost economic prosperity for individuals and their families. According to the U.S. Department of Labor, 94 percent of apprentices who complete an apprenticeship program retain employment with an average annual starting salary of \$70,000.

Recognizing the tremendous opportunity to reskill and upskill our workforce, *Apprenticeships for Tech* aim to increase and diversify the tech talent pool for employers and connect people to promising careers. Those who are new to apprenticeship or on the fence about building an apprenticeship program should consider the following.

The labor market for tech talent will remain tight.

It's no surprise that the labor market trends for tech occupations anticipate that growth will outpace demands. The projected averages for the next 10 years reveal the following occupations will grow at a remarkable speed:

- Data Scientists, +268%
- Cybersecurity, +253%
- Software Developers, +215%
- Web Developers, + 93%
- CIOs and IT Managers, +41%
- Database Admins and Architects, +38%
- IT Support Specialists, +28%
- Systems Analysts and Engineers, +5%

**source: 2022 Cyberstates, CompTIA*

New talent development approaches are needed to increase the supply of workers to fill these roles, and apprenticeship opportunities can attract a greater number of job seekers who did not previously consider a career in tech.

Common workforce pain points persist.

Apprenticeship is an industry-driven, high-quality career pathway that businesses can use to develop their workforce to their specific needs. Employers find apprenticeship programs are the right fit for their business if they:

- Struggle with recruitment and need to build a talent pool
- Need to better distribute workload to align with the competencies of their staff rather than their titles
- Would like to develop people who are more interested in building a career with their company than finding a job
- Want to increase employee retention
- Seek new ways of addressing the challenges of upskilling existing employees

**Tech occupation
employment projected
to reach 9 million by
2031**

**Tech industry ranks
4th in projected
growth for 2022**

Inclusive recruiting reaches untapped talent.

Education, particularly a 4-year college degree, has traditionally been used by industry as a proxy for qualifications. However, more and more businesses are finding that this lens unnecessarily limits their recruitment of talent. In apprenticeships, applicants are assessed and qualified on their aptitude to learn the required competencies – and not qualified through traditional experience and education requirements. The apprentice must successfully complete the apprenticeship program before the employer decides whether to offer a regular position. Recruiting for aptitude is a more inclusive approach that will reach untapped talent.

The confidence gap discourages new entrants.

A study of the confidence gap suggests it is not an isolated issue, but a factor affecting large segments of young people (aged 18 to 34) who may be considering a career in IT. Seven out of ten individuals who participated in the study cited lack of confidence as a factor that contributes to discouragement, which may hinder or completely stop someone who is taking the first step toward a career in technology. In particular, women, communities of color, and individuals with disabilities may not believe they can succeed in IT occupations, or they may not know how to gain entry to them. At the heart of the apprenticeship model is the recognition that a person needs mentorship and opportunities to learn and apply new skills on-the-job to develop the competencies, and thus confidence, to be successful in a tech career. As a result, the apprenticeship model along with successful strategies for recruiting diverse populations can result in pathways to employment for populations traditionally underrepresented in tech jobs.

Talent development programs can yield a positive ROI.

Employers typically pursue a host of talent recruitment and development programs. For example, early career programs such as internships and co-ops are common. Internships provide job seekers the opportunity to work with a company for a limited time, such as a summer. They are typically generalized positions designed to provide exposure to a specific industry rather than to one particular job. Adding apprenticeship to your portfolio of career programs can yield many positive returns, such as excellent new hire conversion rates, lower program costs, and a broader talent supply chain that improves opportunity for diverse hires.

ROI Comparison: Work Based Learning Options

	Apprenticeship	Internship	Co-op
Active Enrollment in a Degree Pathway Required	NO	YES	YES
Average Length	12-24 months	3 months (1-2 rotations)	6 months (2-3 rotations)
New Hire Conversion Rate	91%	46%	28%
Retention Rate after 1 year	91%	70.6%	47.3%
Talent Aquisition Cost (Campus recruiting, sign-on bonuses, housing, relocation, etc)	\$	\$\$\$	\$\$\$
Talent Supply Chain	Universities, Community Colleges, Bootcamps, Veterans, Career, Re-Inventors, Returnships, Incumbent Workforce, High Schools, NGO's	Universities	Universities
Federal Training and Wage Offsets	YES	NO	NO
Rate of Diverse Hires	41.8%	While diversity hiring data is unavailable, according to NACE Trends and Predictions, 81% of employers have diversity recruiting efforts.	

*Source: 2018 Internship & Co-op Survey, National Association of Colleges and Employers

**Source: 2016 Urban Institute report on all RAPIDS states illustrates people of color

HARNESS THE POWER OF APPRENTICESHIPS FOR TECH

We designed a starting point for you.

Apprenticeships for Tech give businesses and partners the information, tools, and support needed to leverage apprenticeship as a starting point for developing tech talent.

Why are these tech occupations a good place to start an apprenticeship?

Apprenticeships for Tech are initially focused on five occupations – tech support, network support, cybersecurity support, data analyst and tech project coordinator – because they are commonly found in all industries and represent a large, broad base from which any tech career pathway is possible.

Tech Support Specialist

Tech Support Specialists are responsible for analyzing, troubleshooting, and fixing day-to-day technology problems and challenges. They may support internal clients or external customers in-person, on the phone, or over webchat. They may help people and businesses troubleshoot the company's technology, or they may work in support of third-party software or hardware. Some of the specific things a person in this role might perform include troubleshooting Wi-Fi routers, obtaining online permissions, or setting up emails and workstations for employees.

Network Support Specialist

Network Support Specialists analyze, troubleshoot, and evaluate problems with computer networks in order to maintain the safe and secure flow of information within the company, and with any external supply chains and customers. This role maintains, configures, and monitors an organization's networks, and properly trains end-users. They ensure networks have minimal downtime and ensure day-to-day operations run smoothly. They may progress to become Network Architects/Engineers.

Cybersecurity Support Technician

Cybersecurity Support Technicians detect cyber threats and make the necessary changes to safeguard an organization. A Security Operations Center (SOC) team typically has tiers of cybersecurity professionals who monitor, direct, contain, and remediate IT threats. They may perform anything from installing, administering and trouble-shooting security solutions, to creating security policies or training documents. People in this role must focus on the big picture and keep all aspects of systems safe from threats. They may progress to become Security Analysts, Cloud Security Engineers, Threat Hunters, Penetration Testers, or Compliance Managers.

Tech Project Coordinator

Tech Project Coordinators manage an organization's information systems project-based work, including the startup, execution, and closure of IT projects. They meet with project sponsors, determine business needs, and use proven methodology to plan, direct, monitor, adjust, and control a project while reporting on goals and resolving issues as they arise. A person in this role continually evaluates risks and meets with stakeholders, while supervising the project team, overseeing vendors, and assuming responsibility for project timelines, cost, and outcomes.

Data Analyst

Data Analysts mine and manipulate data using various tools in support of data analysis to inform data-driven business decisions. In addition, data analysts apply basic statistical methods to summarize data and analyze complex datasets while adhering to governance and quality standards throughout the entire data life cycle.

What are CompTIA's National Guideline Standards?

AIR worked with CompTIA to establish National Guideline Standards (NGS) approved by the U.S. Department of Labor for targeted tech occupations. NGS define:

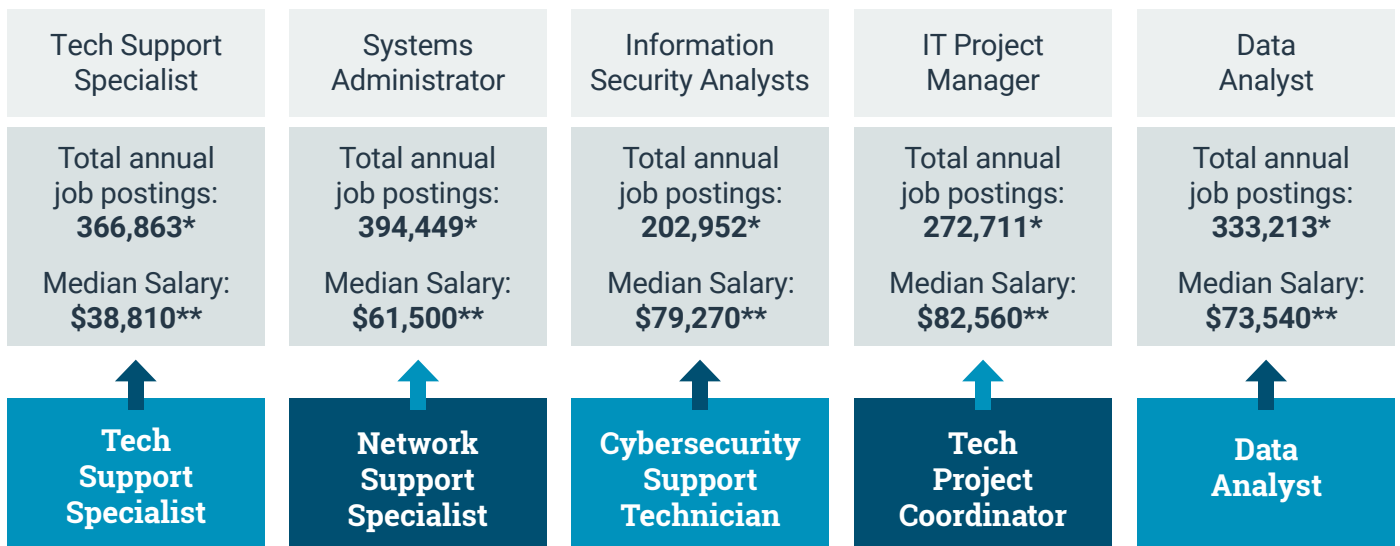
- The **competencies** the apprentice will be trained on-the-job and expected to learn during the apprenticeship;
- The supplemental or related **coursework** to be completed by the apprentice; and
- The policies and terms that need to be established to submit the program for **registration** with the U.S. Department of Labor or a State Apprenticeship Agency, including items such as wage, duration, mentor ratio, etc.

The competencies gained during the apprenticeship are designed to ensure that apprentices are fully qualified for a regular position in the occupation when they graduate from the program. The competency sets for these five tech occupations – Tech Support Specialist, Network Support Specialist, Tech Project Coordinator, Cybersecurity Support Technician, and Data Analyst – can provide the foundation for any tech career pathway. The table below outlines the competency set topics and related coursework for each occupation, as well as the estimated hours and months it will take an apprentice to complete the program.

National Guideline Standards	Tech Project Coordinator	Data Analyst	Tech Support Specialist	Network Support Specialist	Cybersecurity Support Technician
Competency Framework					
Business Acumen	✓	✓	✓	✓	✓
Employability Skills	✓	✓	✓	✓	✓
Basics of Project Management	✓				
Managing Project Constraints	✓				
Communication and Change Management	✓				
Project Tools and Documentation	✓				
General IT Terminology and Concepts	✓	✓			
Computing Infrastructure	✓	✓			
Software and Applications	✓	✓			
Software Development and Database Basics	✓	✓			
Security	✓	✓			
Data Concepts and Environments		✓			
Data Mining		✓			
Data Analysis		✓			
Visualization		✓			
Data Governance, Quality and Controls		✓			
Basic Hardware			✓	✓	✓
Basic Networking			✓	✓	✓
Cloud and Virtualization Technologies			✓	✓	✓
Operating System Basics			✓	✓	✓
IT Security Basics			✓	✓	✓
General IT Operations			✓	✓	✓
Network Fundamentals				✓	✓
Network Implementations				✓	✓
Network Operations				✓	✓
Network Security				✓	✓
Network Troubleshooting				✓	✓
Threats, Attacks, and Vulnerabilities					✓
Architecture and Design					✓
Implementation					✓
Operations and Incident Response					✓
Governance, Risk and Compliance					✓
Estimated duration (number of months, based on 160 hr month)	14	15	15	16	17
Recommended Apprentice Hourly Wage (progressively increasing to average mentor wage)	\$18-\$31	\$23-\$40	\$15-\$25	\$18-\$31	\$25-\$48

National Guideline Standards	Tech Project Coordinator	Data Analyst	Tech Support Specialist	Network Support Specialist	Cybersecurity Support Technician
Related Coursework					
Employability Skills	60.0	60.0	60.0	60.0	60.0
Business Acumen	3.0	3.0	3.0	3.0	3.0
New Employee Skills	15.0	15.0	15.0	15.0	15.0
Customer Engagement Skills	25.0	25.0	25.0	25.0	25.0
Technical and Professional Skills - CompTIA IT Fundamentals (ITF+) Coursework and Certification	41.5	41.5			
Technical and Professional Skills - CompTIA A+ Coursework and Certification			220.0	220.0	220.0
Technical and Professional Skills - CompTIA Network+ Coursework and Certification				158.0	158.0
Technical and Professional Skills - CompTIA Security+ Coursework and Certification				110.0	176.0
Technical and Professional Skills - CompTIA Data+ Coursework and Certification		176.0			
Technical and Professional Skills - CompTIA Project+ Coursework and Certification	81.5				
Help Desk Ticketing			5.0		
Cybersecurity Risk Management - edX Cybersecurity Risk Management Certificate (or similar training)					96.0
Project Management Skills	31.0				
Spreadsheets and Data Manipulation		28.5			
Related Coursework Hours Total Recommended	257.0	349.0	328.0	591.0	753.0

HIGH DEMAND FOR THESE TECH JOB ROLES



These apprenticeships prepare people for in demand jobs

The NGS were developed based on CompTIA's extensive knowledge about the competencies needed for tech occupations and experience developing IT certifications and curriculum. See the Appendix for additional details for each occupation.

How can CompTIA's National Guideline Standards help me develop apprenticeship programs?

Businesses and partners can use the NGS as a starting point to accelerate program development and launch Registered Apprenticeship Programs more quickly. The NGS are:

- Designed to be **customizable** to meet the needs of each employer;
- **Competency-based** which provides more program flexibility;
- Complete with recommended minimum **coursework**; and
- **Complementary** and stackable.

How can National Guideline Standards streamline program registration?

Businesses or other operators of apprenticeship programs have the opportunity to register their program with the U.S. Department of Labor or a State Apprenticeship Agency. We recommend program registration in order to demonstrate that the program meets standards for quality and rigor, and to gain benefits available to Registered Apprenticeship Programs, such as access to certain federal and state resources.

CompTIA's NGS can simplify registration with the U.S Department of Labor or a State Apprenticeship Agency. Specific requirements for an apprenticeship program must be documented and submitted during registration to show the program meets requirements for a high-quality apprenticeship program. The NGS outlines all of these requirements and includes the documents needed to register an apprenticeship.

LET'S GET STARTED

We look forward to connecting with you.

Through this initiative, we are developing a network to expose more individuals and employers to the value and opportunity of apprenticeships and widen the talent pool of women, communities of color, and individuals with disabilities for apprenticeship positions. Businesses and other organizations that join this initiative will be able to tap into both AIR's expertise in developing high-quality apprenticeship programs and CompTIA's expertise in IT education and certification.

To learn more...

- Visit AIR's *Apprenticeships for Tech* website at www.air.org/apprenticeships/tech.
- Contact us at ApprenticeshipsForTech@air.org

About the American Institutes for Research: The American Institutes for Research (AIR) is a nonpartisan, not-for-profit organization that conducts behavioral and social science research and delivers technical assistance to solve some of the most urgent challenges in the U.S. and around the world.

ⁱhttps://www.apprenticeship.gov/sites/default/files/Apprenticeship_Fact_Sheet.pdf

ⁱⁱⁱ<https://www.cyberstates.org/>

^{iv}<https://www.comptia.org/content/research/role-of-confidence-gap-in-tech-career-development>

-Tech Support Specialist

-Network Support Specialist

-Cybersecurity Support Technician

-Tech Project Coordinator

-Data Analyst

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Source: CompTIA analysis of Burning Glass Labor Insights data

*Annual job postings are from 6/21-5/22 (all ads)

**Median salaries are from 6/21-5/22 (0-2 yrs exp)