



GREATER WASHINGTON PARTNERSHIP
CHAMPIONS FOR GROWTH AND SHARED PROSPERITY

2024 Skills Forecasting:

Employer signaling for the future of work

Introduction to employment trends in the region

Introduction.

The interconnected region from Baltimore to Richmond¹ is the 4th largest regional economy in the US. In 2023, the 10 largest industries in the region employed over 5 million people – about 1.5M of whom work in tech, healthcare, manufacturing, and construction-related jobs – and we continue to see increasing demand for talent with 0.7% average annual growth.² However, high rate of unfilled roles in key industries signal a need to bolster talent supply for continued growth.

To help us understand how to better meet the demand for talent and attract more employers, we have applied a skills lens to workforce needs in the region. This is the first of a regular review of skill needs, including forecasting trends to support regional economic growth. This report complements GWP’s Employer Signaling System and supports our goal to align the skills being developed for the regional workforce to the needs of employers.

The report reviews cross-cutting skills that workers need to succeed across industries and spotlights skills within three key industries – Tech/Artificial Intelligence, Advanced Industries,³ and Healthcare – summarized in ~40 skill families. Skill needs in these industries are growing and facing gaps that regional leaders recognize and say will require action.

As demand for talent in the region continues to be high, and the need for cross-cutting social, leadership, and cognitive skills to enable workers’ success across occupations is growing, talent shortages could become barriers for economic growth in the region. Unfilled positions exceed the national average for core regional occupations (e.g., computer, engineering, healthcare).²

Forecasted labor attrition, such as retirements, and a shrinking pipeline of new talent are expected to increase the need for new talent, especially in manufacturing and construction sectors.⁴

What follows is a look at economic trends in the region overall, then a deep dive into skill trends, gaps, challenges, and potential solutions for each industry of focus and cross-cutting skills, as well as potential options to convene stakeholders and strengthen talent to support growth in the region.

Demand growth in the region signals a need to bolster talent supply.

Deep-dives to follow: ■ Advanced Industries ■ Healthcare ■ Tech/AI (Artificial Intelligence)

Top growing occupations ²	Current jobs, thousands, 2023 ²	Projected job growth (CAGR), % 2023-2030 ²
Business, Financial Operations, and Legal Occupations	667	0.6%
Advanced Industries: Production, Installation, Construction, and Engineering Occupations	596	0.6%
Healthcare: Healthcare Practitioners, Healthcare Technologists, and Community Service Occupations	583	1.4%
Hospitality, Food Preparation, and Leisure Occupations	496	0.9%
Management Occupations	459	0.8%
Transportation and Material Moving Occupations	360	1.2%
Tech/AI: Computer and Mathematical Occupations	347	1.2%
Education and Library Occupations	328	1.0%

1. Metro areas including the Baltimore MSA, the Washington DC MSA, and the Richmond MSA
 2. Source: Lightcast™ job postings data, 2019-2023, and Lightcast™ social profile data, 2019 to 2023
 3. Advanced Industries includes Manufacturing, Construction, and Utilities
 4. Source: McKinsey “Will a labor crunch derail plans to upgrade US infrastructure?” (October 2022)

Introduction to skill trends in the region

Skill gaps and demands.



What employers say¹ ...

Highlighted skill family demand change, 2019-2023²

Largest gaps between employer demand and workforce supply²

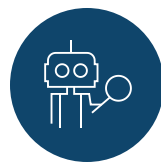


Healthcare

We need to think ahead to make healthcare jobs more attractive for young talent.

58% growth in demand for pharmacy skills (e.g., med dispensation)

- Nursing, patient care
- Emergency medicine and critical care
- Primary care



Tech/AI

Tech/AI jobs are evolving quickly, and we still have gaps in the more traditional tech roles.

111% growth in demand for AI/ML skills (e.g., machine learning)

- Foundational tech competency
- Cybersecurity
- Cloud computing



Advanced Industries

Fewer people are going into skilled trades, and many members of the current workforce will retire, creating challenges.

68% growth in demand for specialized manufacturing skills (e.g., welding)

- Logistics
- Manufacturing technology
- Product development



Cross-Cutting Skills

Foundational skills applicable across occupations such as higher cognitive, and social-emotional skills

Highlighted skill family demand growth, 2019-2023²

12% growth in demand for leadership skills (e.g., team management)

Largest gaps between employer demand and workforce supply²

- Professional communications
- General admin, management
- Critical thinking, problem-solving

Methodology.

The report analyzes ~1000 skills summarized in ~40 “skill families” across Tech/AI, Advanced Industries, Healthcare, and Cross-Cutting categories, from publicly available data (employer job postings and online worker profiles).

To complement the findings and provide a forward-looking perspective we collected input from ~40 regional leaders during GWP’s Skills Forecasting event in May 2024 and related survey. Sources include public data from Lightcast™, BLS, and secondary research, and conversations with regional employers, workforce and education organizations.

McKinsey & Company provided data analysis for the report.

1. Source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop

2. Source: Lightcast™ job postings data, 2019-2023

Quotes paraphrased for legibility and ease of understanding



Healthcare

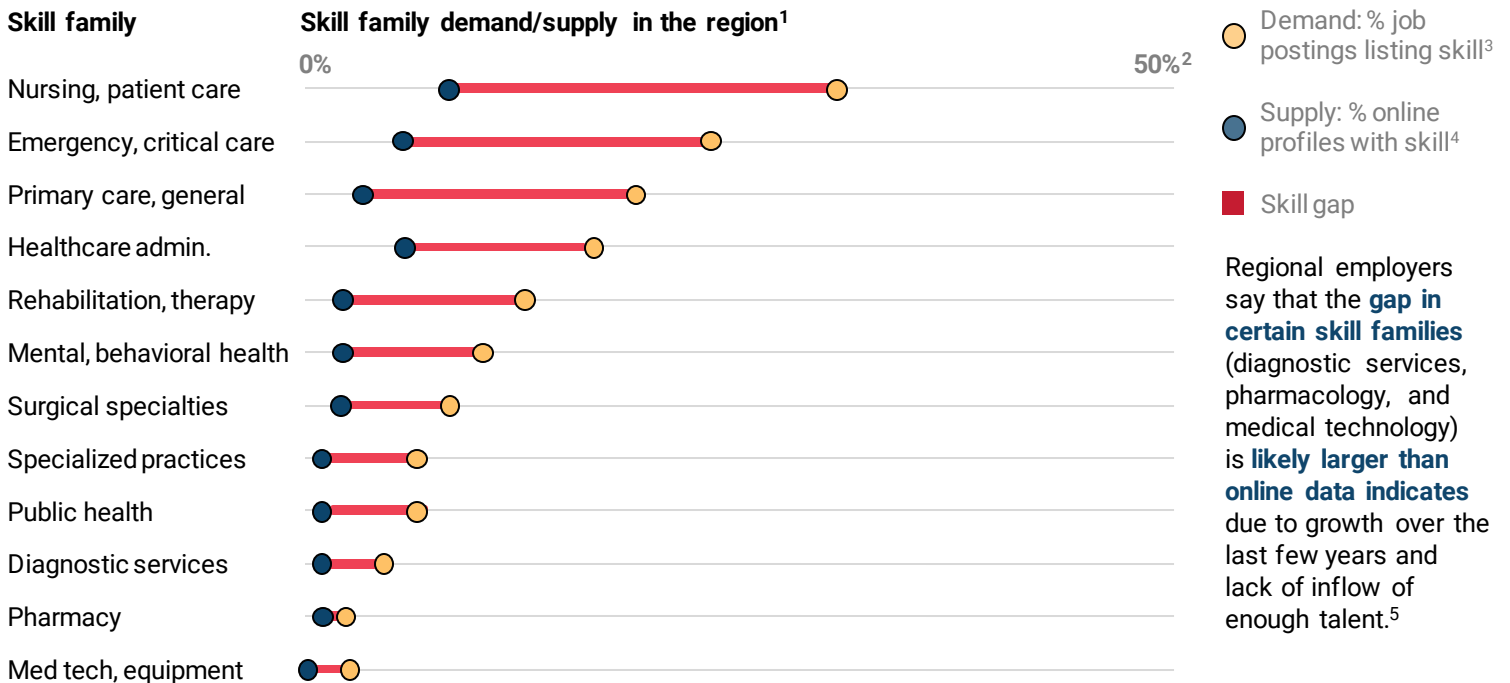
Overview.

The biggest healthcare skill family gaps are in nursing and general patient care support (e.g., case management, patient advocacy, home care) and emergency care.

Skills within broader allied health are driving regional healthcare demand growth (e.g., pharmacology, diagnostic services), regional leaders added that demand for mental health skills will likely grow over the next 5-10 years.

Among the biggest barriers to bridging these skill gaps are the extensive education and training required in healthcare professions, which can be costly and time-consuming for individuals entering the healthcare workforce.

Workforce skill gaps.



Note: Allied health skills are found in multiple skill families (above)

Hispanic workers are underrepresented in healthcare, while Black workers and women are overrepresented in the industry.¹

Black
+33%
relative representation⁶
across healthcare roles
(weighted)

Hispanic
-24%
relative representation
across healthcare roles
(weighted)

Women
+59%
relative representation
across healthcare roles
(weighted)

Women and Black workers are overrepresented in healthcare roles that are lower-paying and require fewer credentials, such as licensed practical and vocational nurses (51% Black, 90% women), but are underrepresented in high-paying healthcare roles.⁶

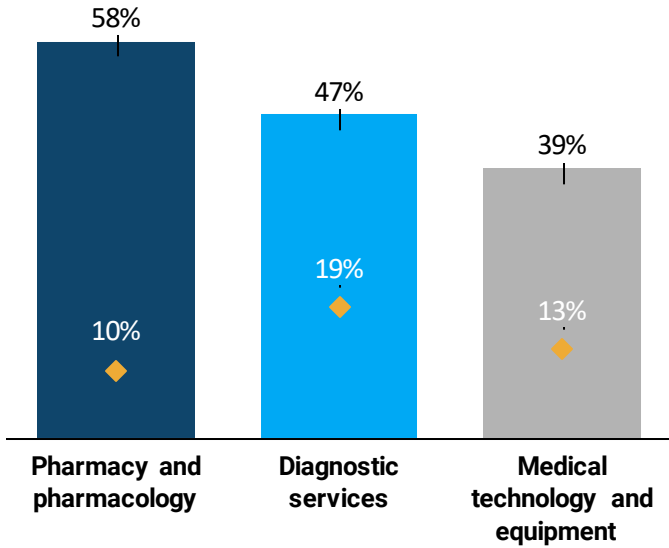
- Source: Lightcast™ job postings data, 2019-2023, and Lightcast™ social profile data, 2019 to 2023
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- % of online profiles with skill = # of profiles listing a skill divided by total # of candidate online profiles
- Source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop
- % by which a group is over- or underrepresented compared to that group as a % of the population



Emerging trends in the region.

Highest-growth skill families by demand change, % 2019-2023^{1,2}

◆ National growth comparison



Top pharmacy skills, by % growth

- Pharmacist assist.: 133%
- Contraindication: 115%
- Med dispensation: 86%

Top diagnostic services skills, by % growth

- Ionizing radiation: 84%
- Pathology: 79%
- Nuclear medicine: 78%

Top med tech skills, by % growth

- Dialysis machine setup: 164%
- Medical telemetry: 41%
- Surgical tech: 12%

Other top Healthcare skills, by % growth

- Telehealth: 371%
- Eating disorder treatment: 125%

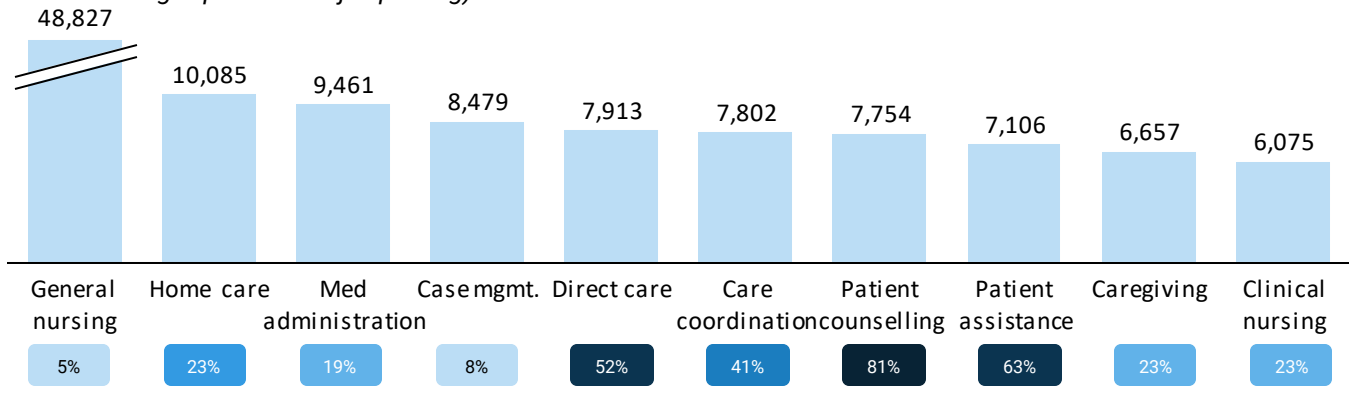
Regional leaders expect **growth in the next 5-10 years** to come more strongly from **mental and behavioral health, preventative/alternative medicine**, and continued growth in **nursing and patient care (incl. allied health)**.³



— We need medical professionals who can manage multiple aspects of patient care and adapt to diverse healthcare environments.

Nursing/patient care - specialized skills/experience required (one or more skills found in each nursing or patient care job posting)¹

Skills in nursing with the highest regional demand, # of unique job postings¹



Projected growth skills, Healthcare, % regional leaders surveyed who project demand for the respective skill will grow in the next 5-10 years (N=8)³



Surveyed regional leaders rank **Healthcare upskilling options** by perceived effectiveness³

- 1 On-the-job training
- 2 Certification programs
- 3 Bootcamps
- 4 2-year associate degrees
- 5 Full degree programs (4-year programs)

1. Source: Lightcast™ job postings data, 2019-2023

2. Demand growth for skill families = weighted avg. change in frequency of online job postings requiring each skill weighted by size of each skill (2019-2023)

3. Source: May 2024 survey of 33 regional workforce and educational leaders

Quote source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop

Quotes paraphrased for legibility and ease of understanding



Challenges to bridging skill gaps.

Regional leaders identify barriers for Healthcare ...



Limited training and on-the-job learning opportunities:

The shortage of educators and experienced professionals with time to train new talent is exacerbated by limited seats in some high-demand educational programs (e.g., nursing), and spots for clinical training (e.g., at hospitals).



High cross-cutting skill requirements:

Healthcare roles require a strong set of interpersonal and communication skills, such as empathy, teamwork, and resilience, that are difficult to assess compared to certifications.



Regulatory impacts: The pool of qualified candidates is affected by strict policy/regulatory standards for some healthcare occupations that can extend the time it takes to fill positions and can require foresight and advanced planning.



Worker knowledge of healthcare requirements:

Youth often lack exposure to the different career options and lack the knowledge of healthcare credentialing, required practical experience, and job opportunities; additionally, there is often a regional mismatch of preferred location vs. needs.

We are piling on to the workload of nurses. We can take an ecosystem approach and think about what skills/tasks could be covered by other workers in the ecosystem that require less education ... and how we can leverage AI in the process.

The introduction of the medical field can begin in middle school ... the complexity of the labor market, licensure, and options are making it difficult for youth to navigate.

Potential solutions identified by regional leaders for Healthcare.

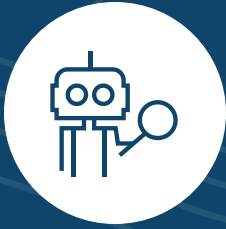
- 1 Take a holistic/ecosystem approach that allows for “top of license” work** to balance the workload and ensure patients receive high-quality and accessible care from healthcare professionals such as nurses, who are becoming responsible for more skills and activities on top of their base roles, including potentially developing new roles/reshaping existing ones guided by patient-centered design.¹
- 2 Work with emerging AI and other tech** to reduce nurses’ and other practitioners’ administrative workloads, allowing them to focus on high-value tasks directly benefitting patients (incl. those requiring interpersonal skills).²
- 3 Emphasize cross-cutting skill training** in all pathways and consider designing specific pathways that build essential interpersonal skills such as patient education and advocacy, particularly as admin tasks become more automated.³
- 4 Collaborate to match talents to needs in the ecosystem** including through managing clinical rotations more centrally in the region.
- 5 Ensure proper resourcing for and increase attractiveness of educator jobs** for in-demand healthcare occupations to close the gap between available instructors and potential healthcare workers or offer fellowships for short-term teaching opportunities.

1. Source: McKinsey “Nursing in 2023: How hospitals are confronting shortages” (2023)

2. Source: McKinsey “Reimagining the nursing workload: Finding time to close the workforce gap” (2023)

3. Source: McKinsey “Making healthcare more affordable through scalable automation” (2020); McKinsey “Tackling healthcare’s biggest burdens with generative AI” (2023)

Source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop
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Tech/AI

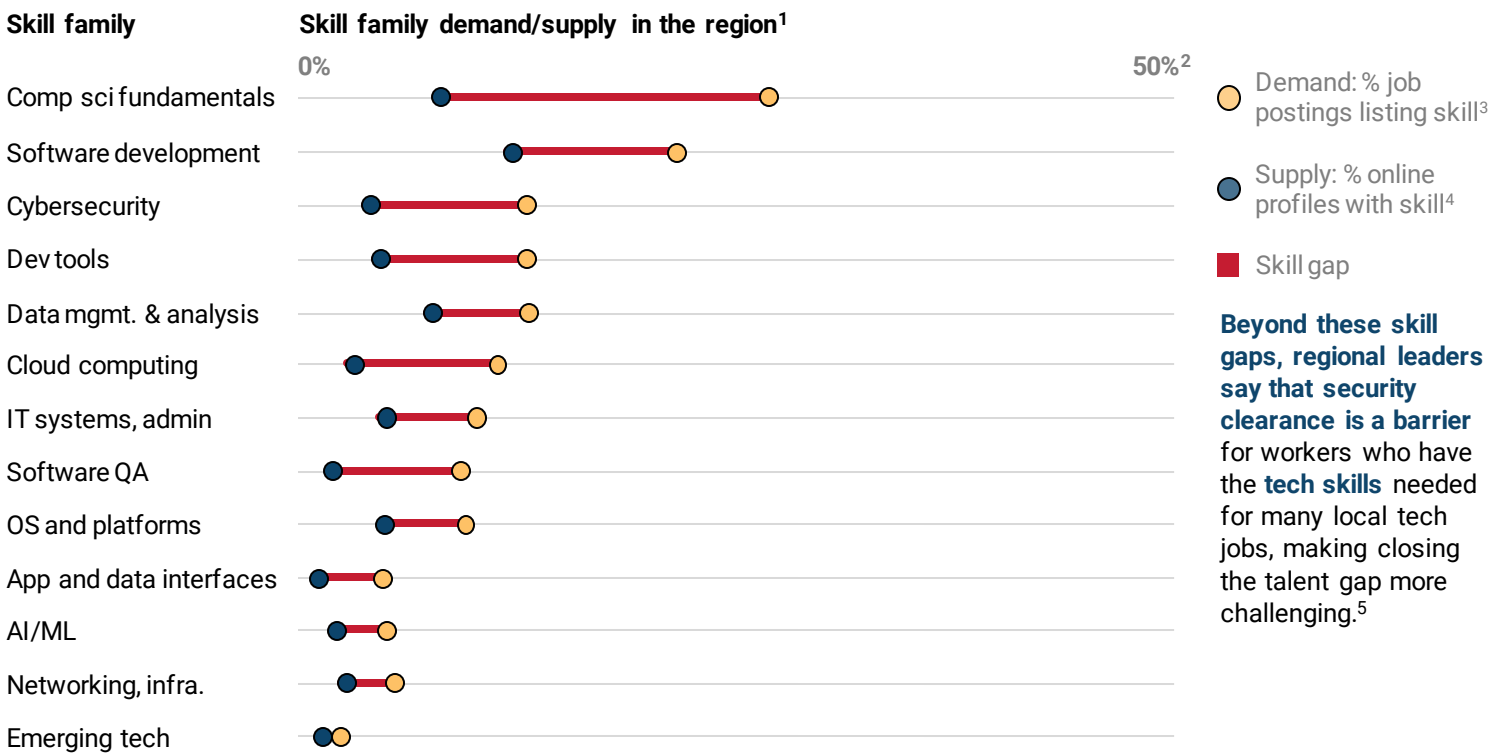
Overview.

Core tech competencies are the biggest skill family gaps identified (e.g., computer science fundamentals, cybersecurity), while emerging skill families like AI/machine learning currently show smaller gaps.

AI and machine learning spearhead regional tech sector growth, despite the smaller gap today, while legacy tech (e.g., legacy operating systems and infrastructure) skills see a decline in demand.

One of the biggest barriers identified by regional leaders in this occupation group is finding employees who have cross-cutting skills that allow them to grow with new tech and measuring proficiency in those skills during the hiring process.

Workforce skill gaps.



Diverse groups are underrepresented in tech roles in the region, (e.g., software developers, systems analysts, etc.), although Black workers are better represented than the national relative representation in tech¹

Black

-22%

relative representation⁶
across tech roles (weighted)

Hispanic

-54%

relative representation
across tech roles (weighted)

Women

-42%

relative representation
across tech roles (weighted)

1. Source: Lightcast™ job postings data, 2019-2023, and Lightcast™ social profile data, 2019 to 2023, BLS
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 6. % by which a group is over- or underrepresented compared to that group as a % of the population

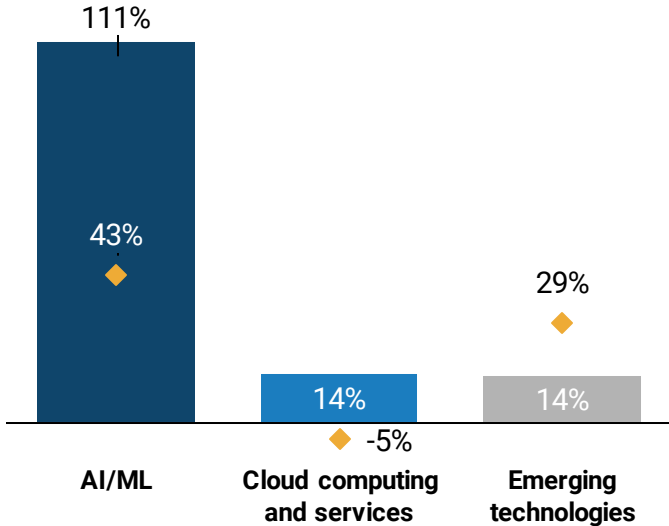


Emerging trends in the region.

Highest-growth skill families

by demand change, % 2019-2023^{1,2}

◆ National growth comparison



Top AI/ML skills, by % growth

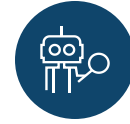
- Artificial intelligence: 196%
- Machine learning: 90%

Top cloud skills, by % growth

- Google Cloud Platform: 76%
- Microsoft Azure: 60%
- Cloud infra: 44%

Top emerging tech skills, by % growth

- ArcGIS: 24%
- Geographic info: 22%
- Geospatial intelligence: 8%



Other top Tech/AI skills, by % growth

- DevSecOps: 197%
- Terraform software: 176%
- Gitlab: 158%



Some things that are currently "core skills" will become obsolete with AI or other advances, and we need to hire people who have a learning mindset and can switch roles as tech changes.

Projected growth for top 5 skill families in Tech/AI

% regional leaders surveyed who project demand for the respective skill will continue to grow in the next 5-10 years (N=12)³



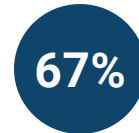
AI/machine learning



Cloud computing and services



Software dev & programming



Cybersecurity and network security



Data mgmt. and analytics

Surveyed regional leaders rank Tech/AI upskilling options by perceived effectiveness³

- 1 Full degree programs (4-year programs)
- 2 Certification programs
- 3 On-the-job training
- 4 Bootcamps
- 5 2-year associate degrees

Regional leaders' projection of growth is in line with current growth in employer/candidate data for **AI/ML skills leading demand growth**, and cloud computing growth.

However, while leaders expect regional growth in **software development** skill demand, data shows that recent growth is higher in **emerging technologies**.

1. Source: Lightcast™ job postings data, 2019-2023

2. Demand growth for skill families = weighted avg. change in frequency of online job postings requiring each skill weighted by size of each skill (2019-2023)

3. Source: May 2024 survey of 33 regional workforce and educational leaders

Quote source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop

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Challenges to bridging skill gaps.

Regional leaders identify barriers for Tech/AI including:



Limited dual expertise in sector specialization and tech skill competency: Tech is integrated into every sector, but workers that have both basic tech skills and specialized industry needs (e.g., tech plus telecom or healthcare) are hard to find.



Challenges for employers to identify and measure cross-cutting, foundational skills: Tech/AI employers want employees with a strong ability to learn and grow with new tech – but these types of foundational skills are perceived to be lacking in curricula and are hard to identify and measure for hiring managers.



Degree-based hiring practices: Job descriptions often ask for traditional experience to prove proficiency (e.g., 5+ years), but tech changes quickly, and specialized experience might not always be the best indicator for future success with new/emerging technologies.



Risk in “hiring to train”: Employers prefer to hire workers who fill 100% of stated job requirements, which reduces the candidate pool and misses candidates who lack formal credentials but have cross-cutting skills and informal competency.



Federal requirements: Regional federal contractors often need additional qualifications for employees, including credentials like bachelor’s degrees or security clearances – and open-source tech often used in AI can be restricted in federal work, preventing on-the-job skill training for that new tech.



— *There's a need for tech / infrastructure crossover roles like telecom wiring that isn't being filled.*

Our hiring managers want someone who fits 100% of the job requirements. But if you bring someone in with 70% who's adaptable and a go-getter, it could work.

Potential solutions identified by regional leaders for Tech/AI.

- 1 Shift recruiting towards skill-based hiring focusing on workers with adjacent tech or industry-specific skills** and build upskilling pathways to reach 100% of role requirements.
- 2 Use the clearance waiting period as a chance to upskill the workforce** through formal certification programs or apprenticeships with part-time, uncleared work.
- 3 Create or sponsor targeted tech apprenticeships** to re-skill existing workers outside of traditional tech backgrounds for critical, high-gap roles.
- 4 Invest in marketing tech professions to traditionally underrepresented communities** and create more affordable pathways to enter tech occupations (e.g., scholarships for existing programs, short-term credentials for career-changers, apprenticeship and internship programs).



Advanced Industries

(Manufacturing, Construction & Utilities)

Overview.

Logistics, construction, and manufacturing tech skills were **identified as the biggest skill family gaps**.

Specialized skills in construction and manufacturing drive growth in Advanced Industries occupations, potentially widening existing skill gaps.

Regional leaders highlight the opportunity to better communicate a compelling picture of “skilled trade jobs of the future” that will excite and attract new entrants to the workforce, overcoming the existing stigma associated with trade positions.

Workforce skill gaps.



Regional employers say that in addition to observed gaps, skills at the **intersection of Advanced Industries and Tech/AI** (e.g., robotics, mechatronics) are a **key area of need**.

The gap in more specialized, and newer, leading-edge skills (e.g., environmental management and specialized skills) is **likely larger than online data indicates**.⁵

Black workers and **women** are underrepresented in Advanced Industries roles, while **Hispanic workers** are overrepresented in frontline roles¹

Black

-28%

relative representation⁶ across Advanced Industries roles (weighted)

Hispanic

+41%

relative representation across Advanced Industries roles (weighted)

Women

-76%

relative representation across Advanced Industries roles (weighted)

There is an **opportunity to improve upward mobility** from frontline or entry-level roles for underrepresented groups across the board – particularly as retirements accelerate for historically overrepresented groups in Advanced Industries.

1. Source: Lightcast™ job postings data, 2019-2023, and Lightcast™ social profile data, 2019 to 2023
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 6. % by which a group is over- or underrepresented compared to that group as a % of the population



Advanced Industries

Emerging trends in the region.

Highest-growth skill families
by demand change, % 2019-2023^{1,2}

◆ National growth comparison

Top specialized manufacturing skills, by % growth

- Soldering: 72%
- Welding: 65%

Top conventional energy skills, by % growth

- Oil and gas: 60%
- Electric power distr.: 33%

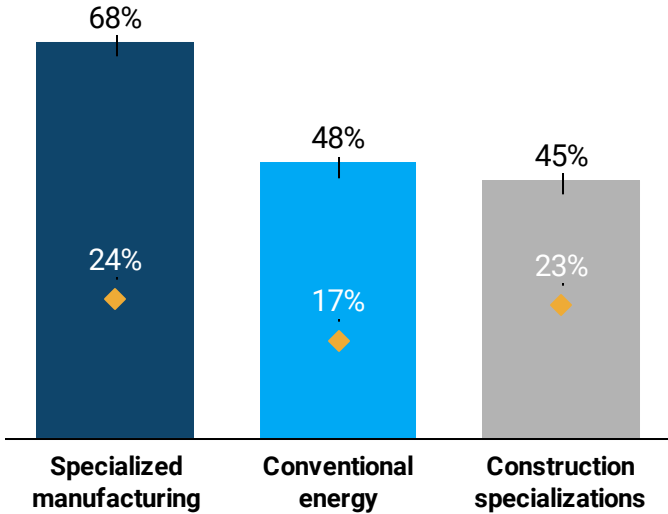
Top construction specialization skills, by % growth

- Roofing: 103%
- Heavy equipment: 41%
- Forklift: 40%



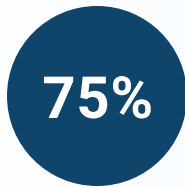
Other top Advanced Industries skills, by % growth

- Export control: 153%
- Commissioning: 137%
- Production process: 76%



The skills missing in the workforce are competence in robotics, digital engineering ... people don't necessarily know how to design something, test it, prototype it, and manufacture it from start to finish.

Additional national research indicates skilled labor workforce in Advanced Industries faces headwinds.³



of Gen Z high schoolers think there is a **stigma associated with vocational school**



of general contractors are **concerned they will not be able to fill their open roles**



years of apprenticeship are needed for several types of skilled trade roles

Manufacturing employers encounter challenges in attracting young people **due to a widespread stigma about careers in skilled trades, manufacturing, and construction**. This issue is exacerbated by outdated perceptions held by parents, who often encourage their children to pursue college after high school instead.

Surveyed regional leaders **rank Advanced Industries upskilling options** by perceived effectiveness⁴

- 1 Certification programs
- 2 On-the-job training
- 3 2-year associate degrees
- 4 Bootcamps
- 5 Full degree programs (4-year programs)

Our survey indicates that regional experts anticipate the highest growth in the region over the next 5-10 years to be in construction specializations, renewable energy, and construction core skills.⁴

1. Source: Lightcast™ job postings data, 2019-2023

2. Demand growth for skill families = weighted avg. change in frequency of online job postings requiring each skill weighted by size of each skill (2019-2023)

3. Source: McKinsey "Tradespeople wanted: The need for critical trade skills in the US" (April 2024)

4. Source: May 2024 survey of 33 regional workforce and educational leaders

Quote source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop
Quotes paraphrased for legibility and ease of understanding



Advanced Industries

Challenges to bridging skill gaps.

Regional leaders identify barriers for Advanced Industries including:



Shrinking skilled workforce: Nationally, fewer young workers are choosing skilled trade careers in manufacturing and construction, and many current skilled and credentialed workers are approaching retirement.¹



Training resource bottleneck: Regional leaders say that most Advanced Industries roles require significant hands-on training and experience on specialized equipment – but there are only limited workers trained at apprenticing new talent, creating a training resource bottleneck.



Perception issue for manufacturing, construction: Young workers are opting away from “skilled trades” due to hesitation about trade school and outdated ideas of what a manufacturing or construction career might look like.²



Lack of diversity in the hiring pool: The underrepresentation of Black workers and Women across Advanced Industries jobs limits the hiring pool for high-demand skills; some barriers include often informal, network-based hiring and gender-biased perception of manufacturing & construction.



New York has built the high school programs, colleges, physical infrastructure they needed to be a manufacturing hub. Do we need to build more learning infrastructure to get more manufacturing jobs and talent in our region?

The skilled trade jobs are not often seen as desirable. Students aren't interested in them because they have a false idea of what these occupations look like.

Potential solutions identified by regional leaders for Advanced Industries.

- 1 Rebrand manufacturing roles** highlight career growth, meaningful work and purpose in these roles, and the growing role of tech (the “digital toolbelt”) – areas of focus that will appeal particularly to the younger generation.
- 2 Consider nontraditional profiles in hiring** to find talent with some of the hard and cross-cutting skills needed for manufacturing, construction, or specialized roles (including underrepresented talent and mid-career workers) and re-/upskill them.
- 3 Create an adequately resourced ecosystem** linking both educators and employers to create apprenticeships and hands-on re-/upskilling programs for new and mid-career workers, and craft accessible pathways to employment.
- 4 Build an upskilling culture within employers with emerging learning technology:** Empower and encourage managers to give workers on-the-job coaching and skill training, including leveraging new learning tech like VR and digital twin to enable remote learning and augment hands-on skill training.³

1. Regional leaders echo national trend on workforce concerns - Source: McKinsey “Will a labor crunch derail plans to upgrade US infrastructure?” (October 2022)

2. Source: McKinsey “Tradespeople wanted: The need for critical trade skills in the US” (2024)

3. Source: McKinsey “Seeing the unseen: Transforming safety by improving hazard sensitivity” (December 2019); McKinsey: “For OEMs in the United States, the aftermarket is fertile ground” (April 2019)

Source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop
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Cross-Cutting Foundational Skills

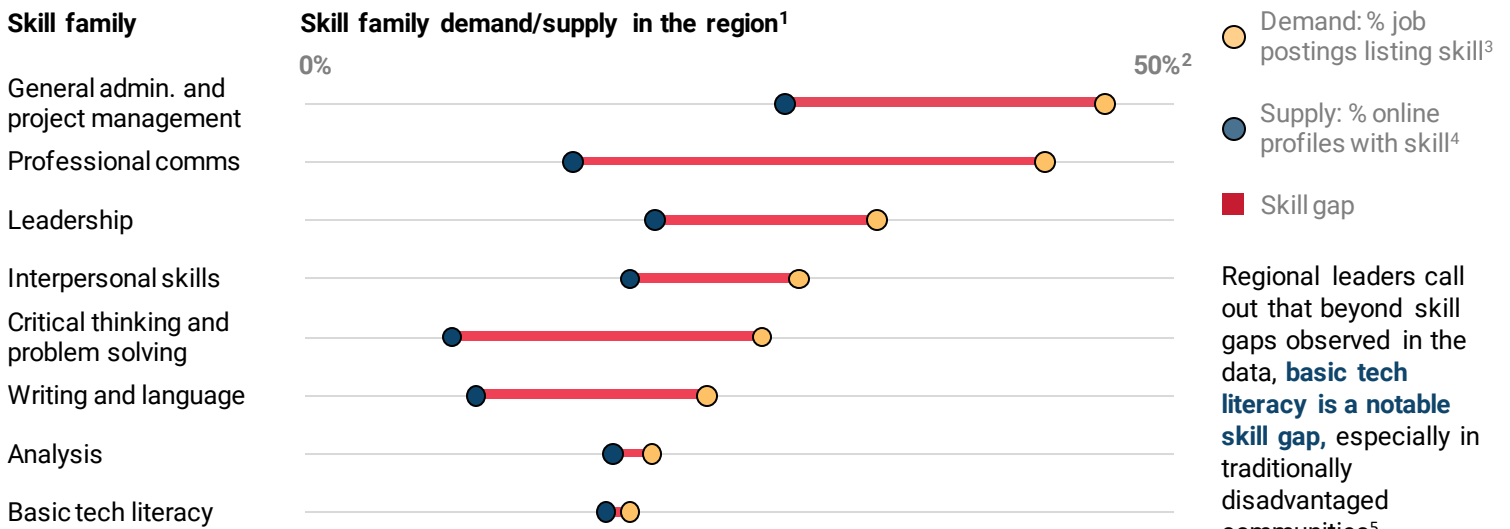
Overview.

The biggest cross-cutting skill family gap identified is professional communication (e.g., presentation, verbal communication).

Leadership skills have an outsized role in driving demand growth across cross-cutting skills, followed by interpersonal skills, and critical thinking.

Significant barriers exist to bridge these gaps as cross-cutting skills are not always prioritized in structured training programs/there are limited options outside of full-time degrees compared to hard or technical skills, and outcomes are hard to measure.

Workforce skill gaps.



Regional leaders call out that beyond skill gaps observed in the data, **basic tech literacy is a notable skill gap**, especially in traditionally disadvantaged communities⁵

They emphasize that **addressing gaps in cross-cutting skills** will require more funding and integration early in middle school but also on-the-job training and mentorship, which has been identified as hard to standup effectively



All courses are around hard skills, and roles often require a bachelor's degree to start with. But how do we address cross-cutting skills in the workforce more broadly?

Future of Work research indicates that **gaps in communication, leadership, critical thinking, and technological literacy will likely continue to grow** and shows that these skills will be **key to professional advancement** but opportunities for training remain limited⁶

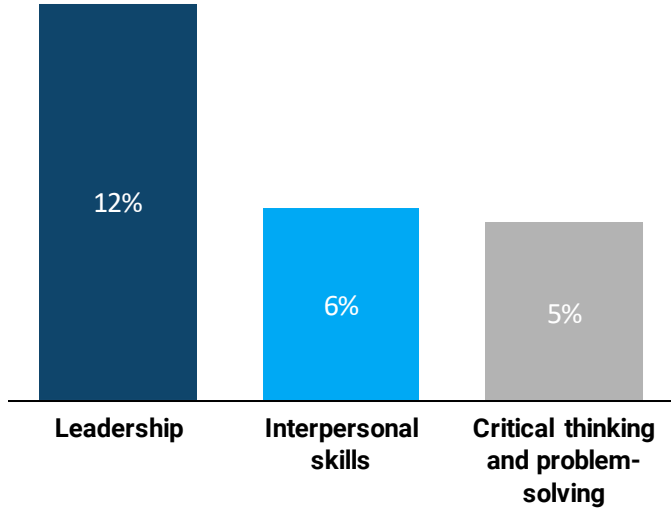
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 6. Source: McKinsey: "Defining the skills citizens will need in the future world of work"
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Cross-Cutting

Emerging trends in the region.

Highest-growth skill families
by demand change, % 2019-2023^{1,2}



Top leadership skills, by % growth

- Resilience: 55%
- Goal setting: 47%
- Team management: 31%

Top interpersonal skills, by % growth

- Compassion: 99%
- Empathy: 88%
- Curiosity: 42%

Top critical thinking skills, by % growth

- Critical thinking: 59%
- Analytical thinking: 30%
- Innovation: 17%

Other top Cross-Cutting skills, by % growth

- Constructive feedback: 72%
- People management: 45%
- Active listening: 35%

Regional leaders expect **growth in the next 5-10 years** to be driven by demand for skills within **analysis, technological literacy, and critical thinking and problem solving**, followed by **leadership**.³



Some things that are currently "core skills" will become obsolete with AI or other advances, and we need to hire people who have a learning mindset and can switch roles as tech changes.

Of 17 regional leaders surveyed for cross-cutting skills, the following number said that **each of the following skills would grow or decline regionally in the next 5-10 years**³ ...



Surveyed regional leaders **rank cross-cutting upskilling options** by perceived effectiveness³

- 1 Full degree programs (4-year programs)
- 2 Certification programs
- 3 On-the-job training
- 4 Bootcamps
- 5 2-year associate degrees



Educators concentrate on hard skills through courses measured in credit hours, while employers typically seek candidates with degrees. Yet the question remains, with the limited time and knowledge for acquiring these skills and considering that higher education has not evolved in over a century, should we reconsider whether employers should focus on degrees?

1. Source: Lightcast™ job postings data, 2019-2023

2. Demand growth for skill families = weighted avg. change in frequency of online job postings requiring each skill weighted by size of each skill (2019-2023)

3. Source: May 2024 survey of 33 regional workforce and educational leaders, project management is bucketed in general admin. Project Management responses integrated in General Admin responses due to high skills overlap (approximate for 17 total responses)

Quote source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop

Quotes paraphrased for legibility and ease of understanding



Cross-Cutting

Challenges to bridging skill gaps.

Regional leaders identify barriers for Cross-Cutting Foundational Skills including:



Opportunities to learn:

Regional leaders perceive a lack of important cross-cutting skills training early in education, which leads to gaps later when they are needed for jobs – also pointing to a potential mismatch between how educators attempt to build these skills, and the success of this education in the workplace.



Barriers to skill-building experience:

Cross-cutting skills are built through internship and on-the-job training outside of the classroom; traditionally disadvantaged groups and mid-career workers often lack access to these opportunities.



Employer assessment challenges:

Measuring cross-cutting skills during the hiring process can be difficult because they are not as easily quantifiable as technical skills, leading employers to look for proxy metrics to assess candidates' proficiency e.g., 4-year full-time degrees and specific previous work experience.



Difficulty for candidates to articulate their cross-cutting skills:

These skills are self-reported in profiles – and some candidates may overstate their proficiency, while regional leaders highlighted that some candidates may not know how to identify or show their mastery of these skills to employers.



The development of these skills can't begin when people enter the workforce – it needs to begin at the middle school level

We don't have great tools to understand – how do employers evaluate and assess whether or not a person has these cross-cutting skills?

Potential solutions identified by regional leaders for cross-cutting skills.

- 1 Integrate cross-cutting skill and foundational skill development in education,** starting early in the K-12 system to ensure students develop cross-cutting and technical skills before entering the workforce.
- 2 Recruit for and cultivate learning mindsets at work:** Beyond hard-skill qualifications, companies that formally and informally prioritize employees' cross-cutting skill development and ability to grow with industry changes can create a future-proofed workforce.
- 3 Emphasize on-the-job training:** Mentorship and coaching programs can open hiring pathways for workers who have cross-cutting skills but lack specific technical capabilities, or for hires who are technically proficient but need coaching in cross-cutting skills.
- 4 Incentivize managers to coach their teams on priority foundational skills:** Employers can build incentives into the manager review process to encourage leaders to take the time to develop their teams' hard and cross-cutting skills.

Potential options to build skills in the region from Baltimore to Richmond



Building the future workforce

Policy makers and education institutions, starting in middle school, could work with **employers** to expand efforts to address skill gaps in **curricula revisions based on employer signals¹**, with a focus on (and funding for) **cross-cutting skills** such as interpersonal and leadership skills, and then measure the effectiveness in building these skills.

Educators and employers could work together to foster awareness of regional **in-demand career options** and provide transparency on **entry expectations as well as training pathways** for these roles well in advance of young workers finding their first jobs – particularly for Tech/AI and Healthcare, which have industry-specific credentials that show hard skill proficiency (e.g., CISSP for cybersecurity or a accredited practical nursing certificate) beyond bachelor’s degrees.

Employers, training providers, and workforce development institutions may consider expanding, funding, and improving apprenticeship and vocational programs to build specialized skills for growing industries.



Succeeding through skill-based talent journeys

Employers could look beyond degrees to incorporate a skills focus when hiring and developing workers, including:

- Building a skill framework that emphasizes skills in addition to educational degrees/certifications.
- Working toward making the recruiting process skill-focused (e.g., situational interviewing) and objective with standardized scoring to emphasize ‘skill fit’ over perceived ‘cultural fit’.
- Creating life-long learning pathways that emphasize skill development and include growth in critical skill proficiency as one metric used for performance management/promotions.

Employers and community groups could partner for wider candidate reach to traditionally underrepresented talent and improved support for “nontraditional” candidates to build and showcase “soft skills.”

Educators and employers can collaborate to overcome the “paper ceiling” faced by workers without post-secondary education or specific certifications by prioritizing employer-funded/-enabled credentialing (for jobs requiring clearance, this can be done during the waiting process).

- Educators and employers could conduct a critical review of which types of education are most effective for each industry and prioritize those in addition to traditional certifications/degrees as needed.

Stakeholders across the talent ecosystem could provide information and data to policymakers and regulators to help inform future policies and updates to regulations for rapidly evolving job groups (e.g., in healthcare, tech) in accordance with changes in skill needs.



Upskilling and reskilling the existing workforce

Training providers could improve the flexibility and affordability of lifelong education through, for example, modular credential programs tailored to career pathways and recognition of on-the-job experience towards credentials for people who cannot practically or financially drop out of the workforce for a full-time program.

Stakeholders across the workforce ecosystem could collaborate to improve data availability and identify reskilling pathways for occupation groups with declining demand but adjacent skillsets for high-growth occupations.



Ensuring equitable skill-building

Workforce leaders could foster awareness and accessibility of education-to-employment pathways for nontraditional and underrepresented communities by considering alternative talent sources, building targeted skill-building programs (incl. cross-cutting foundational skills for youth and adults), and providing targeted funding.

Employers could take steps to improve career progression for diverse talent by creating clear pathways, implementing supports for growth such as mentorship programs, and reducing bias in promotions.

1. E.g., GWP’s Employer Signaling System and other similar efforts can be leveraged for better transparency and understanding of skill needs
Source: Regional leader input from the May 2024 Greater Washington Partnership Skills Forecasting Workshop; expert conversations, McKinsey research: “Taking a skills-based approach to building the future workforce” (2022), “Tradespeople wanted: The need for critical trade skills in the U.S.” (2024), “How health systems and educators can work to close the talent gap” (2023)



Appendix and data sources

Appendix: Skill families and skills

Methodology.

The region from Baltimore to Richmond combines the metro areas of Baltimore, MD, Washington DC, and Richmond, VA. The report analyzes ~1000 skills summarized in ~40 “skill families” across Tech/AI, Advanced Industries, Healthcare, and Cross-Cutting categories, from publicly available data (employer job postings and online jobseekers’ profiles). Online sources may not fully reflect skills in jobs for which workers are recruited through offline channels and may overestimate gaps in “table stakes” skills. To complement the findings and a forward-looking perspective we collected input from ~40 regional leaders during GWP’s Skills Forecasting event in May 2024 and related survey. Sources include public data from Lightcast™, BLS, and secondary outside research to support the findings, and conversations with regional employers, workforce and education organizations.

Tech/AI

- **AI/ML:** Machine learning, artificial intelligence, deep learning
- **Application and data interfaces:** Application Programming Interface (API), RESTful API
- **Cloud computing and services:** AWS, Microsoft Azure, web services, cloud services, cloud computing, SaaS, cloud tech, cloud infrastructure, Amazon S3, PaaS, Google Cloud Platform (GCP), AWS CloudFormation, Amazon Elastic Compute Cloud, cloud computing architecture, IaaS, cloud security, cloud engineering, cloud-native computing, cloud migration, dataflow, OpenShift, public cloud, serverless computing, hybrid cloud computing
- **Computer science fundamentals:** Computer science, automation, information systems, operating systems, software systems, algorithms, emerging tech, IT infrastructure, data architecture, technical analysis, data structures, data centers, data pipelines, stored procedure, computing platforms, computer programming, algorithm design, parsing, embedded systems, system software
- **Cybersecurity and network security:** Cybersecurity, authorization, firewall, information assurance, security requirements analysis, incident response, network security, authentication, information systems security, VPN, Federal Info Security Mgmt. Act, encryption, public key infrastructure, IAM, SIEM, POA&M, vulnerability assessments, cyber engineering, hardening, NIST 800, NIST 800-53, pen testing, application security, info privacy, Nessus, cyber ops, IT security architecture, vulnerability mgmt., vulnerability scanning, cryptography, assessment and authorization, security engineering, cyber defense, data security, FedRAMP, intrusion detection and prevention, SSO, enterprise security, infrastructure security, malware analysis, insider threat, HBSS, OAuth, security testing, Azure Active Directory, eMASS, cyber risk, cyber security policies, computer security, comms security, endpoint security, intrusion detection systems
- **Data management and analytics:** SQL, data mgmt., data collection, ETL, PostgreSQL, relational databases, MySQL, NoSQL, database admin, Microsoft SQL servers, data quality, info mgmt., data processing, MongoDB, data integrity, PL/SQL, Apache Kafka, data governance, data integration, database design, Oracle databases, database mgmt., data migration, database systems, data storage, relational database mgmt. systems, data lakes, database mgmt. systems, data access, file systems, data acquisitions, data store
- **Developmental tools and environments:** Scripting, Microsoft SharePoint, Atlassian Confluence, Windows PowerShell, virtualization, Elasticsearch, containerization, backup devices, shell script, command-line interface, virtual machines, Middleware, Unix Shell, VMware ESX servers, virtual environment
- **Emerging technologies:** Geographic information systems, ArcGIS, geospatial intelligence, load balancing, IoT
- **IT systems and administration:** Configuration mgmt., tech support, system admin, ServiceNow, Jenkins, Kubernetes, active directory, help desk support, IT service mgmt., ansible, IT infrastructure library, knowledge mgmt., enterprise application software, issue tracking, mgmt., info systems, IaC, enterprise architecture, Apache Maven, Puppet (configuration mgmt., tool), IT ops, network admin, technical mgmt., robotic process automation, incident mgmt.

Appendix: Skill families and skills

Tech/AI skill families

- **IT systems and administration:** IT capacity mgmt., software installation, end user training and support, digital transformation, group policy, software config mgmt., tech services, system config, firmware, user accounts, release mgmt., Microsoft Power Automate/Flow, desktop support, SolarWinds, Linux admin, problem mgmt., Chef, patch mgmt., system monitoring, tech assistance, system support
Networking and infrastructure: Network engineering, telecom, LAN, network switches, network routing, WAN, computer networks, TCP/IP, networking hardware, network infrastructure, network architecture, network troubleshooting, DHCP, network monitoring, network protocols, border gateway protocol, Apache Tomcat, Oracle WebLogic server, SOAP
- **Operating systems and platforms:** Microsoft Windows 10, CentOS, peripheral devices, Linux, computer hardware, Android OS, Windows servers, Unix
- **Software development and programming:** On prem, Azure DevOps, scaled Agile framework, Agile project mgmt., front end design, SAML, government off-the-shelf, DevSecOps, Terraform, CI/CD, JIRA, Docker, interoperability, microservices, COTS, solution design, spring boot, software documentation, system testing, full stack dev, scalability, sprint planning, software engineering, systems integration, concept of operations, software design, user requirement documents, systems design, Red Hat Enterprises Linux, systems engineering, testability, software architecture, development environment, system requirements, systems development, Agile methodology, software development, programming tools, Agile software development, scrum, systems architecture, DevOps, sprint retrospectives, development testing, continuous deployment, requirements elicitation, requirements analysis, front end, DoDAF, app development, app deployment, app architecture, systems analysis, JSON, HTML, software dev lifecycle, open source tech, lightweight directory access protocols, back end, systems dev lifecycle, web design, SharePoint development, system implementation, OOP, Oracle SQL developer, performance tuning, CSS, functional requirement, .NET framework, web dev, Angular, service-oriented architecture, Eclipse, software design patterns, object-oriented design, Microsoft visual studio, XML, Bootstrap, web apps, spring framework, TDD, model view controller, HTML5, ASP.NET, team foundation server
- **Software QA:** Gitlab, Github, software technical review, Git (version control system), version control, debugging, code review, SQA/SQC, UAT, test planning, Bitbucket, unit testing, test automation, integration testing, test data, regression testing, software testing, functional testing, Selenium, Junit, Cucumber, Apache subversion

Advanced Industries (Manufacturing, Construction & Utilities) skill families

- **Construction core skills:** Commissioning, submittals, construction management, construction, cost estimation, renovation
- **Construction specializations:** Tints and shades, powered industrial truck (PIT) operation, roofing, heavy equipment, forklift truck, painting, architectural design, carpentry
- **Conventional energy:** Electric power systems, oil and gas, electric power distribution
- **Environmental management and engineering:** Environmental monitoring, wastewater, mitigation
- **Logistics and warehouse management:** Inventory management system, inventory control systems, supply chain planning, export control, material handling equipment, cycle counting, palletizing, material requirements planning, supply chain, inventory management, pallet jacks, warehousing, inventory staging, physical inventory, material handling, production planning, inventory control, materials management, stocks (inventory), finished goods, supply chain management, logistics
- **Manufacturing technologies:** Mills, production line, lathes, military standards and specifications, aerospace basic quality system standards, production process, tooling, equipment inspection, machining

Appendix: Skill families and skills

Advanced Industries (Manufacturing, Construction & Utilities) skill families (con't.)

- **Manufacturing technologies (con't.):** Manufacturing processes, machinery, mechanical systems, ISO 9000 series, machine operation, drilling, production equipment, equipment operation, lean manufacturing, good manufacturing practices, production management, manufacturing operations, test equipment, production schedule, Six Sigma methodology
- **Product development:** Rapid prototyping, fabrication, product requirements, new product development, prototyping
- **Specialized manufacturing:** Food manufacturing, microelectronics, soldering, welding
- **Transportation and supply chain:** Flight testing

Healthcare skill families

- **Alternative medicine and therapies:** Therapeutic procedures, chiropractics, recreational therapy
- **Diagnostic services:** Medical imaging, X-rays, fluoroscopy, portable X-rays, echocardiography, contrast medium, blood transfusions, pathophysiology, ionizing radiation, pathology, nuclear medicine, medical ultrasonography, interventional radiology, X-ray computed tomography, radiography, MRI, radiation protection, endoscopy, mammography, venipuncture, phlebotomy, blood banking
- **Emergency medicine and critical care:** CPR, acute care, ED, trauma care, ICU, critical care, wound care, emergency medicine, NICU, EMS, splinting, progressive care unit, life support, emergency nursing, PICU, high acuity medicine
- **Healthcare administration:** Medical records, electronic medical record, MedSTAR, discharge planning, healthcare industry knowledge, patient flow, Epic EMR, medical office procedures, computerized physician order entry, medical history documentation, copay collection and processing, patient registration, HIPAA compliance, clinical documentation, hospital information systems, patient discharges, ICD coding (ICD-9/ICD-10), medical billing, CPT coding, clinical leadership, health admin, practice management, MEDITECH EHR, discharge summaries, protected health info, clinic management systems, hospital admissions, patient interviews, medical orders for life-sustaining treatments, patient referral, patient coordination, health systems, health info management, personal health records, medical coding, dental informatics, medical records filing, eClinicalWorks (ECW), nursing admin, clinical systems and networks, HCFA regulations, medical management
- **Medical technology and equipment:** Medical devices, sphygmomanometers, nebulizer, medical software, dialysis machine setup, medical telemetry, surgical technology, medical equipment, patient management software
- **Mental and behavioral health:** Clinical psychology, CBT, mental health counseling, eating disorder treatment, motivational interviewing, crisis prevention, behavioral health, psychology, group therapy, psychosocial assessments, family therapy, medical status examination, autism spectrum disorders, psychotherapy, intervention plans, behavior management, crisis intervention, psychiatry, developmental disabilities, psychological evaluations, peer support, community mental health services, psychiatric and mental health nursing, Alzheimer's Disease, DISC assessments, dementia, mental diseases, applied behavior analysis
- **Nursing and patient care (see next page):** Nursing, home healthcare, medication administration, case management, direct patient care, care coordination, patient education and counseling, patient assistance, clinical nursing, activities of daily living (ADLs)

Appendix: Skill families and skills

Healthcare skill families (con't.)

- **Nursing and patient care (con't.):** Nursing process, caregiving, nursing practices, personal care, patient advocacy, medical surgical nursing, care management, nursing homes, integrated care, hospice, long-term care, patient/family education, urgent care, follow-up care, assisted living, toileting, care planning, companionship, clinical supervision, ambulatory care, transitional care, perioperative care, palliative care, basic patient care, health promotion, life skills development, nursing diagnosis, nursing assessment, informed consent, patient rights, communicating with patients, pain management, telephone triage, family support, progressive care medicine, bedside manner, skin care, patient comfort, hygiene, postoperative care, continuing care, symptom management, pediatric nursing, emotional support, community education, inpatient care, dialysis nursing, fall risk management, perioperative nursing, adaptive equipment, nursing home care, orthotics, medication monitoring, bedside care, nursing theories
- **Pharmacy and pharmacology:** Narcotics, intradermal, medication inventory, automated dispensing machines, pharmacist assistance, contraindication, medication dispensation, medical prescription, pharmaceuticals, clinical pharmacy, admixtures, pharmacotherapy, pharmacy operations
- **Primary care and general medicine:** Treatment planning, pediatrics, nursing care, vital signs, medical terminology, clinical experience, mental health, radiology, patient safety, patient treatment, geriatrics, primary care, intravenous therapy, electrocardiography, clinical practices, Medicare, Medicaid, health assessment, triage, medical privacy, asepsis, internal medicine, patient observation, hospital experience, blood pressure, nursing interventions classification, senior living, managed care, telehealth, family medicine, dentistry, utilization management, intramuscular injection, hospital medicine, surgical suturing, patient evaluation, oral hygiene, sterile techniques and procedures, clinical assessments, dental hygiene, chronic diseases, dressing changes, diagnostic tests, physiology, point-of-care testing, holism, medical practices and procedures, preventative care, geriatric nursing, JCAHO standards, IV hydration, ophthalmology, medical necessity, OASIS, optometry, Care Standards Act 2000, central venous catheter, biopsies, medical ethics, Dentrax, wound dressing, disease management, health risk assessments, dental care, pulse oximetry, evidence-based practice, sports medicine, clinical rounds, dental procedures, respiration, universal precautions, oral health, elderly care, orthodontics, medical licensing (health law), vaccination administration, oral care, trauma informed approaches, vascular access, urinary catheterization, Foley catheter, dental surgery, stoma, dental health, heart rate, virtual health, palpation
- **Public health and preventative medicine:** Infection control, health ed, infectious diseases, communicable diseases, community health, disease prevention, population health, infection, nutrition services, illness prevention, tuberculosis management, immunology, health impact assessments, dietetics, emergency preparedness, isolation procedures
- **Rehabilitation and therapy:** Rehabilitation, PT, disabilities, occupational therapy, speech-language pathology, substance abuse, therapeutic interventions, respiratory therapy, swallowing disorders, speech therapy, exercise therapy, exercise physiology, deficits, exercise programs, communication disorders, manual therapy, comprehensive planning, oxygen therapy, arterial blood gas analysis, gait training
- **Specialized medical practices:** Oncology, dialysis, bloodborne pathogens, cardiology, hematology, pulmonology, neurology, end-stage renal disease, urology, hemodialysis, capillary, chemotherapy, diabetes mellitus, cardiac catheterization, gastroenterology, artificial cardiac pacemakers, respiratory care, dermatology, cath lab, cardiac surgery, medical ventilators, pulmonary function testing, cancer, hypertension, cardiac dysrhythmia, holter monitor, peritoneal dialysis, neurosurgery, nephrology, hemodynamics, electrophysiology, spirometry, oncology nursing, vascular surgery, sputum, endocrinology, sepsis, anticoagulant, neurotrauma, biotherapy

Appendix: Skill families and skills

Healthcare skill families (con't.)

- **Surgical specialties:** Surgery, OR, orthopedics, OB/GYN, post-anesthesia care unit, anesthesia, surgical procedures, general surgery, perinatal care, anesthesiology, outpatient surgery, surgical services, sedation, cardiotocography, surgical instruments, postpartum care, podiatry, prenatal development, pap tests, tracheotomy, invasive procedures, human musculoskeletal system, oral and maxillofacial surgery, orthopedic surgery, procedural sedation and analgesia, musculoskeletal injuries, audiology, maternal-fetal medicine, surgical assist

Cross-cutting skill families

- **Analysis:** Research, mathematics, data analysis, forecasting, arithmetic, business acumen, information gathering, technical acumen, sorting, intellectual curiosity
- **Critical thinking and problem-solving:** Problem solving, organizational skills, troubleshooting, innovation, critical thinking, analytical skills, strategic planning, investigation, resourcefulness, strategic thinking, analytical thinking, complex problem solving, needs assessment
- **General administration and project management:** Management, operations, sales, detail oriented, budgeting, admin functions, consulting, QA/QC, clerical works, filing, negotiation, business admin, spreadsheets, collections, memos, record keeping, team oriented, team building, security policies, safety assurance, calculators, people management, constructive feedback, transcribing, progress reporting, incident reporting, emergency procedures, virtual teams, order entry, checklists, data reporting, multitasking, scheduling, cleanliness, Project management, prioritization, timelines, milestones, project planning, project schedules, Microsoft Project, proposal development, project implementation, project coordination, project management software, project scoping, product documentation, requirements management, change requests, resource allocation, PMO, PMI methodology, stakeholder management, project portfolio management
- **Leadership:** Action oriented, resilience, teaching, goal setting, reliability, team management, governance, mentorship, adaptability, advocacy, training & development, team performance management, accountability, decision making, ethical standards & conduct, leadership, advising, proactivity, willingness to learn, composure, tactfulness, self-discipline, supervision, time management, coordinating, professionalism, planning, ability to meet deadlines, influencing skills, team leadership, leadership development, motivational skills, creative thinking, relationship management, decisiveness, quick learning, strong work ethic, self-motivation, punctuality, goal-oriented
- **Interpersonal:** Teamwork, positivity, enthusiasm, collaboration, energetic, relationship building, compassion, honesty, greeting customers, creativity, empathy, cooperation, diplomacy, rapport building, reservations, patience, curiosity, personal integrity, friendliness, resilience, customer service,
- **Professional communication:** Interpersonal comms, verbal comm skills, presentations, program management, telephone skills, persuasive comms, public speaking, listening skills, active listening, non-verbal communication
- **Technology literacy:** Microsoft Office, Microsoft Excel, Microsoft PowerPoint, computer literacy, Microsoft Outlook, IT, Microsoft Word, word processing, typing, smartphone operation, Microsoft Windows, video conferencing, computer terminals
- **Writing, literature, and language:** Writing, English language, report writing, editing, multilingualism, Spanish language, grammar, proofreading, technical writing, bilingual (Spanish/English), French language, writing systems, proposal writing, punctuation and capitalization, foreign languages



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