

RESEARCH BRIEF

**Employment Outcomes of NOVA Graduates:
Engineering, A.S. Program**

Introduction

This Research Brief presents the employment outcomes of 420 NOVA graduates of the Engineering, A.S. program from 2007 through 2017 (Section I) and provides employment data for Engineering (A.S. and B.S.) graduates (Section II).¹ The employment data includes target occupations, job postings, companies hiring, and highly desired job skills and qualifications for Engineering (A.S. and B.S.) graduates in the NOVA region during the specified period.²

Data were extracted utilizing the Economic Modeling Specialists International (EMSI) product, which provides employment data derived from government sources, online job posting activity, and professional networking profiles (e.g., LinkedIn) and résumés. EMSI employment data were also used to determine the employment outcomes and workforce credentials of NOVA graduates.³

Key Findings

- The average estimated annual salary for NOVA Engineering, A.S. program graduates employed in an engineering-related occupation is \$92,657, nearly twice the average estimated annual salary for NOVA Engineering, A.S. program graduates *not* employed in engineering-related occupations (\$47,405).
- The employment opportunities for Engineering (A.S. and B.S.) graduates in the NOVA region are favorable for target occupations including Software Developers of Applications, Software Developers of Systems Software, and Information Security Analysts.
 - Regionally, these target occupations have expected job growth and median hourly earnings higher than national median hourly earnings for these occupations.
- Booz Allen Hamilton Holding, Leidos Holdings, General Dynamics, Science Applications International, and Mantech International are the top five companies hiring Engineering (A.S. and B.S.) graduates in the NOVA region.

¹ Graduates may have earned additional degrees beyond the Engineering (A.S.).

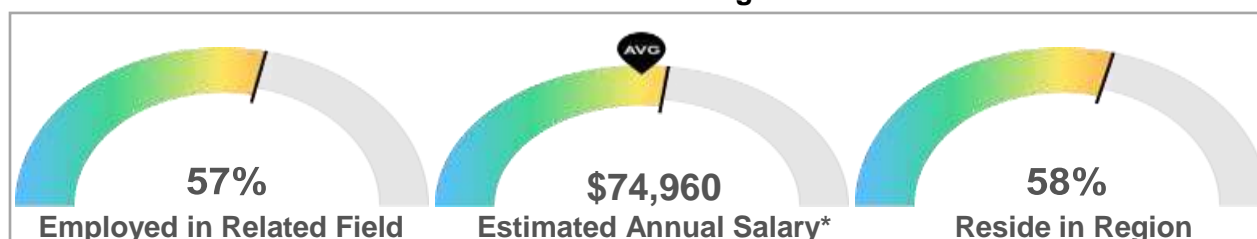
² Job postings comprise both full-time and part-time positions.

³ EMSI: <https://www.economicmodeling.com/>

Section I. Employment Outcomes of NOVA Graduates

This section provides recent (2019) employment outcomes information for 420 NOVA graduates of the Engineering, A.S. program who graduated from 2007 through 2017.⁴ Of these graduates, the average estimated annual salary was \$74,960, and slightly more than half (57 percent) were employed in an engineering-related occupation (Figure 1).⁵ Among those NOVA graduates that were employed in an engineering-related occupation, their average estimated annual salary (\$92,657) was nearly twice as much as those *not* employed in an engineering-related occupation (\$47,405).

**Figure 1. Employment Outcomes of NOVA Engineering (A.S.)
Graduates: 2007 through 2017**



* The average estimated annual salary among all NOVA 2007 through 2017 graduates was \$66,652.

Alumni Occupations

The top in-field occupations of NOVA's Engineering, A.S. program graduates were Teachers and Instructors (4 percent), Computer User Support Specialists (3 percent), Software Developers of Applications (3 percent), Civil Engineers (3 percent), and Postsecondary Teachers (3 percent) (Table 1).⁶

**Table 1. Occupations among NOVA Engineering (A.S.)
Graduates: 2007 through 2017**

Occupations	SOC Code**	Graduates	
		#	%
Teachers and Instructors	25-3099	16	3.8
Customer Service Representatives*	43-4051	15	3.6
Computer User Support Specialists	15-1151	14	3.3
Software Developers of Applications	15-1132	14	3.3
Civil Engineers	17-2051	13	3.1
Postsecondary Teachers	25-1099	13	3.1
Retail Salespersons*	41-2031	13	3.1
Electrical Engineers	17-2071	12	2.9
Software Developers of Systems Software	15-1133	10	2.4
Mechanical Engineers	17-2141	9	2.1
Cashiers*	41-2011	7	1.7
Management Analysts	13-1111	7	1.7
<i>Unclassified Occupation*</i>	99-9999	34	8.1

*Occupations classified as out-of-field and not related to the program of study.

**Standard Occupational Classification (SOC) is a U.S. Bureau of Labor Statistics occupational coding standard (<https://www.bls.gov/soc/>)

Note: Occupations with percentages less than 1.5% are not included in the table.

⁴ Graduates may have earned additional degrees beyond the Engineering (A.S.).

⁵ The NOVA region refers to Arlington County, Fairfax County, Loudoun County, Prince William County, Alexandria City, Fairfax City, Falls Church City, Manassas City, Manassas Park City, and Washington, D.C.

⁶ In-field occupations refer to those occupations that are related to the Engineering program of study.

Employers and Job Titles of Alumni

The top employers of NOVA's Engineering, A.S. program graduates included Northern Virginia Community College (4 percent), Virginia Polytechnic Institute and State University (2 percent), and George Mason University (2 percent) (Table 2).

**Table 2. Top 20 Employers of NOVA Engineering (A.S.)
Graduates: 2007 through 2017**

Employers	Graduates	
	#	%
Northern Virginia Community College	15	3.6
Virginia Polytechnic Institute & State University	8	1.9
George Mason University	8	1.9
Amazon.com, Inc.	4	1.0
Naval Research Laboratory	4	1.0
United States Patent and Trademark Office	4	1.0
Lockheed Martin Corporation	4	1.0
Micron Technology, Inc.	4	1.0
Graham Holdings Company	4	1.0
Harris Teeter Supermarkets, Inc.	4	1.0
United States Department of the Air Force	4	1.0
Best Buy Co., Inc.	3	0.7
Securitas Security Services USA, Inc.	3	0.7
Northrop Grumman Corporation	3	0.7
Wegmans Food Markets, Inc.	2	0.5
United States Army	2	0.5
Fairfax County Public Schools	2	0.5
Chevy Chase Bank, F.S.B.	2	0.5
R & K Inc.	2	0.5
University of Virginia	2	0.5

The most popular job titles among NOVA's Engineering, A.S. program graduates were Tutor (3 percent), Design Engineer (2 percent), Retail Sales Associate (2 percent), and Software Engineer (2 percent) (Table 3).

**Table 3. Top Job Titles of NOVA Engineering (A.S.)
Graduates: 2007 through 2017**

Job Titles	Graduates	
	#	%
Tutor	12	2.9
Design Engineer	10	2.4
Retail Sales Associate	8	1.9
Software Engineer	8	1.9
Customer Service Representative	7	1.7
Mechanical Engineer	7	1.7
Administrative Assistant	6	1.4
Project Manager	6	1.4
Systems Engineer	5	1.2
Cashier	4	1.0
Data Center Technician	4	1.0
Engineering Intern	4	1.0
Graduate Assistant	4	1.0
Security Officer	4	1.0

Note: Job titles with percentages less than 1.0% are not included in the table.

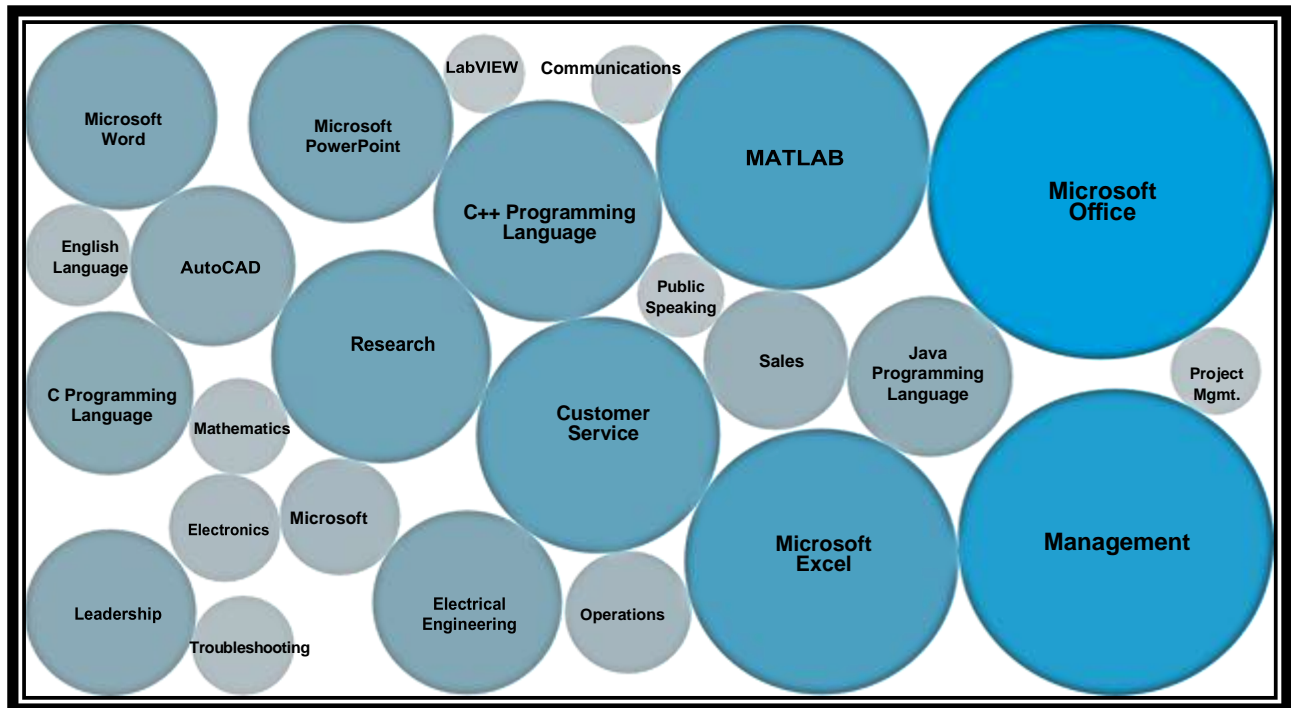
Alumni Skills

The top hard and common skills of NOVA's Engineering, A.S. program graduates included Microsoft Office (28 percent), management (26 percent), MATLAB (23 percent), and Microsoft Excel (23 percent) (Table 4 and Figure 2, below).⁷

**Table 4. Top 10 Hard and Common Skills of NOVA Engineering (A.S.)
Graduates: 2007 through 2017**

Hard and Common Skills	Graduates	
	#	%
Microsoft Office	119	28.3
Management	109	26.0
MATLAB	95	22.6
Microsoft Excel	95	22.6
Customer Service	85	20.2
C++ (Programming Language)	80	19.1
Research	77	18.3
Microsoft PowerPoint	72	17.1
Microsoft Word	68	16.2
Electrical Engineering	67	16.0

**Figure 2. Hard and Common Skills of NOVA Engineering (A.S.)
Graduates: 2007 through 2017**



⁷ Hard skills are defined as technical or specialized skills often acquired through formal education, while common skills refer to soft and transferable skills broadly utilized in various professions.

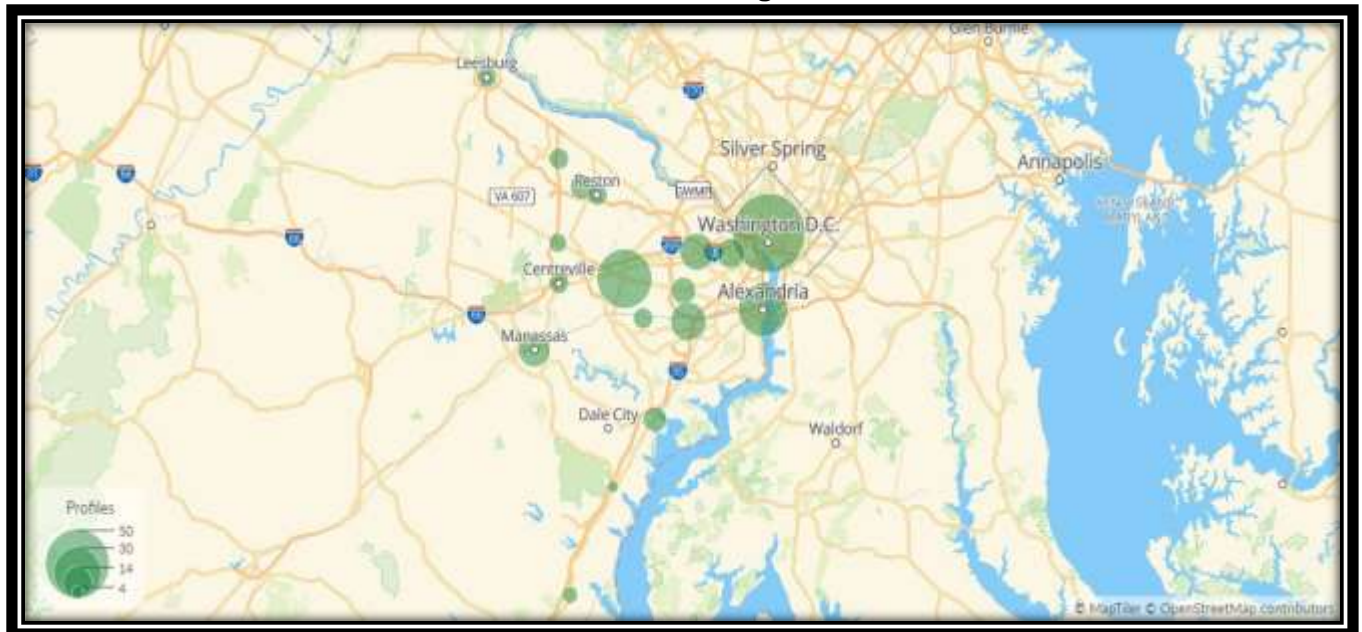
Alumni Locations

The top locations where NOVA's Engineering, A.S. program graduates resided included Washington, D.C. (15 percent), Fairfax, VA (9 percent), Alexandria, VA (8 percent), Blacksburg, VA (6 percent), and Springfield, VA (5 percent). Overall, seventy-two percent resided in the state of Virginia (Table 5 and Figure 3, below).

**Table 5. Top 20 Locations of NOVA Engineering (A.S.)
Graduates: 2007 through 2017**

Locations	Graduates	
	#	%
Washington, DC	64	15.2
Fairfax, VA	39	9.3
Alexandria, VA	33	7.9
Blacksburg, VA	25	6.0
Springfield, VA	19	4.5
Falls Church, VA	18	4.3
Manassas, VA	16	3.8
Arlington, VA	13	3.1
Annandale, VA	11	2.6
Herndon, VA	10	2.4
Woodbridge, VA	10	2.4
Burke, VA	8	1.9
Centreville, VA	8	1.9
Leesburg, VA	8	1.9
Reston, VA	8	1.9
Sterling, VA	8	1.9
Chantilly, VA	7	1.7
Richmond, VA	6	1.4
Stafford, VA	6	1.4
Dumfries, VA	4	1.0

**Figure 3. Locations of NOVA Engineering (A.S.)
Graduates: 2007 through 2017**



Section II. Regional Employment Opportunities for NOVA Graduates

This section provides regional employment opportunities data and provides job postings for target occupations within the NOVA region for Engineering (A.S. and B.S.) graduates.⁸

Target Occupations

In 2018, regionally, there were about 71,000 jobs and 6,000 job openings in target occupations for Engineering (A.S. and B.S.) graduates.⁹ Among these target occupations, median hourly earnings were \$53.79—23 percent higher than the \$43.62 national median hourly earnings for these target occupations. The projected job growth among these target occupations is 7 percent from 2018 to 2023—2 percentage points fewer than the projected national growth for target occupations (9 percent). Annual job openings for target occupations for Engineering (A.S. and B.S.) graduates were greatest for Software Developers of Applications (1,523 openings) and Software Developers of System Software (893 openings) (Table 6).

Table 6. NOVA Region Job Openings, Earnings, and Growth of Target Occupations: 2018

Target Occupations	# of Jobs	# of Job Openings	Median Hourly Earnings	% Job Growth (2018 – 2023)	Location Quotient*
Software Developers of Applications	15,455	1,523	\$56.09	15.4%	1.9
Software Developers of Systems Software	12,603	893	\$58.56	2.8%	3.4
Information Security Analysts	6,488	594	\$55.51	11.0%	6.6
Postsecondary Teachers	4,494	396	\$36.26	4.9%	1.0
Civil Engineers	4,146	328	\$46.10	1.0%	1.3
Computer Network Architects	3,843	262	\$62.76	0.8%	2.8
Operations Research Analysts	3,326	272	\$53.34	10.3%	4.0
Engineers (General)	3,088	207	\$68.27	0.7%	2.1
Web Developers	2,508	228	\$42.82	9.3%	1.4
Mechanical Engineers	2,350	167	\$52.76	2.3%	0.8
Electrical Engineers	1,965	141	\$55.78	2.4%	1.1
Electronics Engineers (excluding Comp. Engineers)	1,964	127	\$60.39	-2.2%	1.5
Architectural and Engineering Managers	1,736	125	\$76.51	0.6%	1.1
Cost Estimators	1,349	144	\$38.41	3.5%	0.9
Marine Engineers and Naval Architects	1,227	80	\$49.67	1.5%	8.2
Aerospace Engineers	838	53	\$68.00	0.2%	1.4
Industrial Engineers	791	66	\$47.26	8.0%	0.3
Natural Sciences Managers	755	61	\$65.25	-0.7%	2.0
Computer Hardware Engineers	738	54	\$61.47	4.6%	1.3
Environmental Engineers	426	34	\$45.49	6.1%	0.9

*Location Quotient = the ratio of an occupation's share of employment in a given area to that occupation's share of employment in the U.S. as a whole. For example, an occupation that makes up 10 percent of employment in a specific metropolitan area compared with 2 percent of U.S. employment would have a location quotient of 5 for the area (signifying the occupation is roughly 5 times more concentrated regionally than nationally).

Note: Table includes the top 20 target occupations for Engineering (A.S. and B.S.) graduates.

From January 2018 through December 2018, there was an average of about 5,200 Engineering graduates hired monthly for the top 20 target occupations in the NOVA region.¹⁰ The top average monthly job hires were for Software Developers of Applications (1,052 hires) and Postsecondary Teachers (943 hires) (Table 7 and Figure 4, next page).

⁸ The NOVA region refers to Arlington County, Fairfax County, Loudoun County, Prince William County, Alexandria City, Fairfax City, Falls Church City, Manassas City, Manassas Park City, and Washington, D.C.

⁹ The Engineering A.S. and B.S. were the minimum degree qualifications in these job postings.

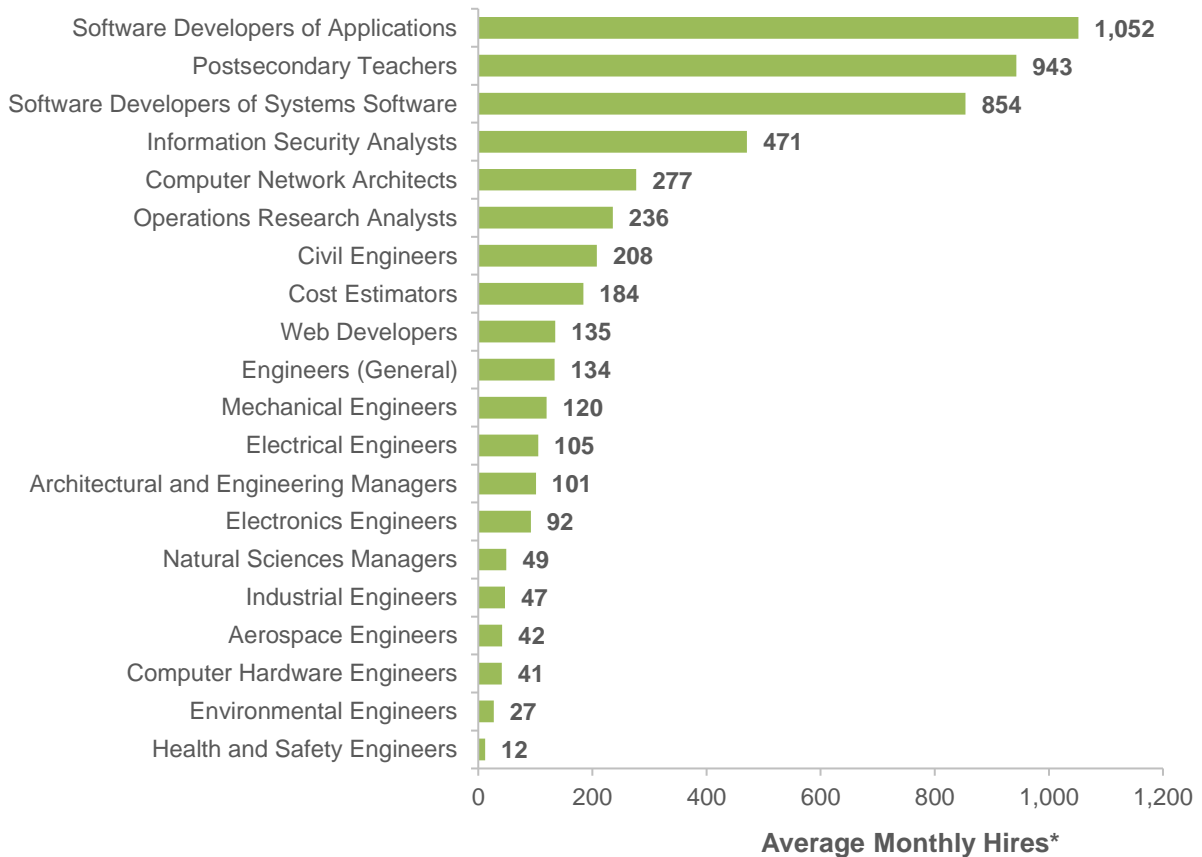
¹⁰ Includes Engineering graduates with an A.S., B.S., or post-baccalaureate degree

Table 7. NOVA Region Top 20 Job Hires in Target Occupations: 2018

Target Occupations	Average Monthly Hires*
Software Developers of Applications	1,052
Postsecondary Teachers	943
Software Developers of Systems Software	854
Information Security Analysts	471
Computer Network Architects	277
Operations Research Analysts	236
Civil Engineers	208
Cost Estimators	184
Web Developers	135
Engineers (General)	134
Mechanical Engineers	120
Electrical Engineers	105
Architectural and Engineering Managers	101
Electronics Engineers (excluding Computer Engineers)	92
Natural Sciences Managers	49
Industrial Engineers	47
Aerospace Engineers	42
Computer Hardware Engineers	41
Environmental Engineers	27
Health and Safety Engineers (excluding Mining Safety Engineers and Inspectors)	12

* Average monthly hires include Engineering graduates with an A.S., B.S., or post-baccalaureate degree.

Figure 4. NOVA Region Top 20 Job Hires in Target Occupations: 2018



* Average monthly hires include Engineering graduates with an A.S., B.S., or post-baccalaureate degree

Job Postings in NOVA Region

Companies in the NOVA region with the most job postings from January 2018 through December 2018 for Engineering (A.S. and B.S.) graduates included Booz Allen Hamilton Holding Corporation (6,472 postings), Leidos Holdings (4,462 postings), and General Dynamics Corporation (2,875 postings) (Table 8 and Figure 5, below).

Table 8. Top 20 Companies Posting Jobs in the NOVA Region: 2018

Company Name	# of Unique Job Postings	Median Duration of Job Posting (# of days)
Booz Allen Hamilton Holding Corporation	6,472	45
Leidos Holdings, Inc.	4,462	24
General Dynamics Corporation	2,875	44
Science Applications International Corporation	2,486	41
Mantech International Corporation	2,384	22
Oracle Corporation	2,349	65
Caci International, Inc.	1,549	74
Capital One Financial Corporation	1,433	45
BAE SYSTEMS PLC	1,310	48
Deloitte LLP	1,294	51
Engility Holdings, Inc.	1,246	50
Northrop Grumman Corporation	1,152	45
Perspecta, Inc.	1,069	8
Anthem, Inc.	1,068	26
Raytheon Company	1,067	57
Vencore, Inc.	975	55
Cleared People, LLC	951	60
Capital Markets Placement, Inc.	837	6
Amazon.com, Inc.	788	64
Workbridge Associates	735	161

Figure 5. Top 20 Companies Posting Jobs in the NOVA Region: 2018



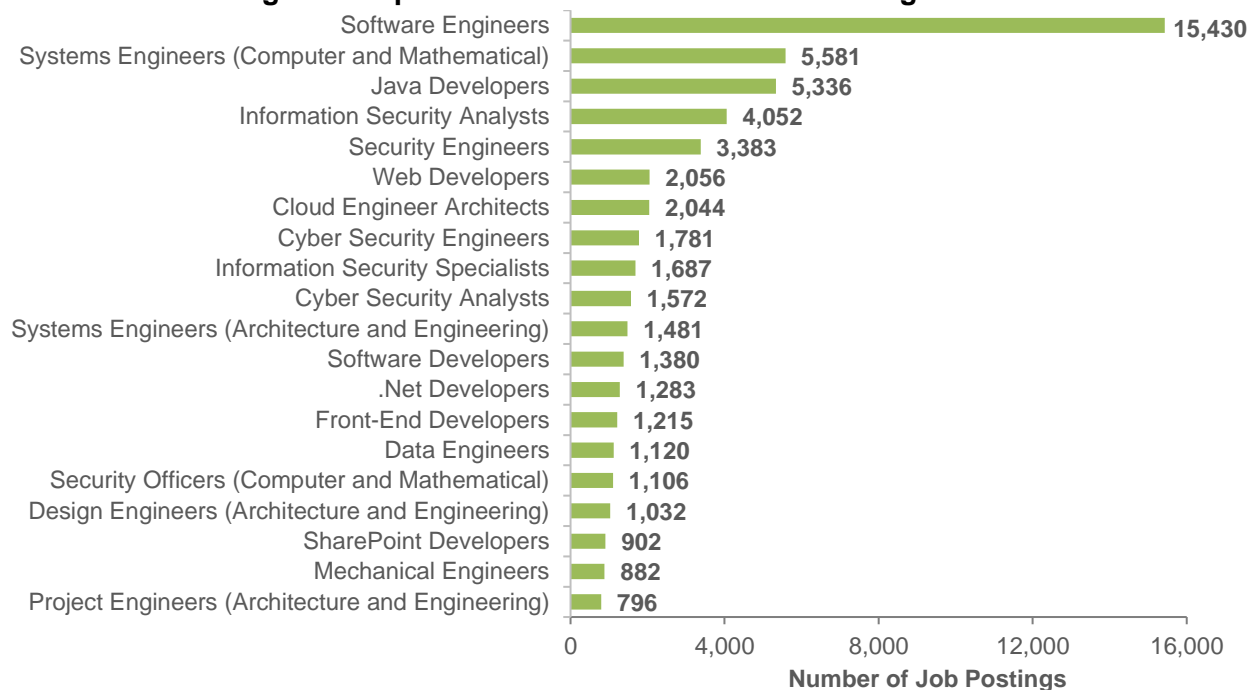
Job Titles in NOVA Region

From January 2018 through December 2018, the most frequently posted job titles for Engineering (A.S. and B.S.) graduates in the NOVA region were for Software Engineers (15,430 postings), Systems Engineers/Computer and Mathematical (5,581 postings), and Java Developers (5,336 postings) (Table 9 and Figure 6, below).

Table 9. Top 20 Posted Job Titles in the NOVA Region: 2018

Job Title	# of Unique Job Postings	Median Duration of Job Posting (# of days)
Software Engineers	15,430	37
Systems Engineers (Computer and Mathematical)	5,581	43
Java Developers	5,336	35
Information Security Analysts	4,052	46
Security Engineers	3,383	40
Web Developers	2,056	41
Cloud Engineer Architects	2,044	36
Cyber Security Engineers	1,781	42
Information Security Specialists	1,687	45
Cyber Security Analysts	1,572	45
Systems Engineers (Architecture and Engineering)	1,481	50
Software Developers	1,380	46
.Net Developers	1,283	39
Front-End Developers	1,215	35
Data Engineers	1,120	29
Security Officers (Computer and Mathematical)	1,106	37
Design Engineers (Architecture and Engineering)	1,032	41
SharePoint Developers	902	40
Mechanical Engineers	882	45
Project Engineers (Architecture and Engineering)	796	42

Figure 6. Top 20 Posted Job Titles in the NOVA Region: 2018



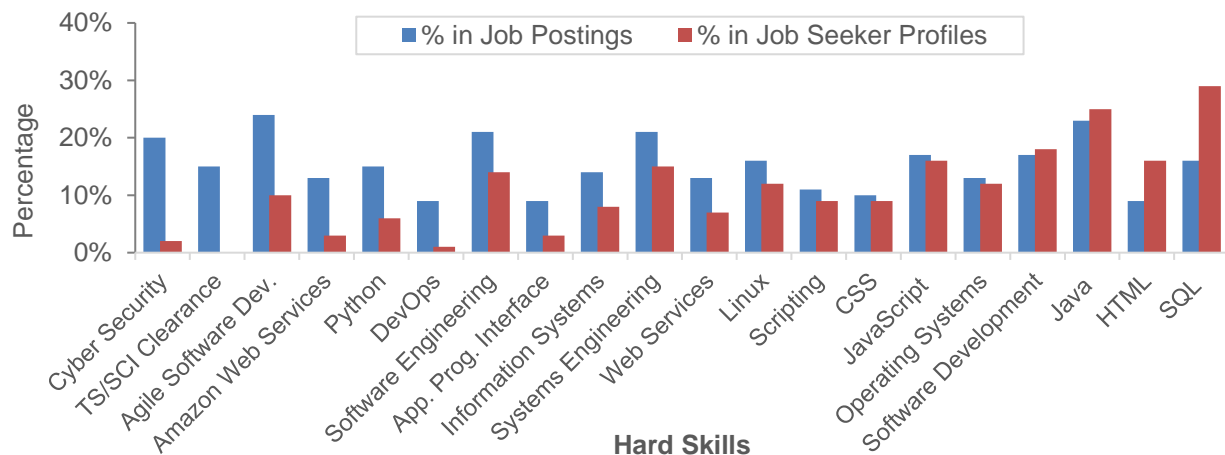
Desired Hard Skills

Table 10 and Figure 7 (below) show disproportions between the top *hard* skills that NOVA region employers sought among their job applicants and the hard skills that Engineering (A.S. and B.S.) graduates mentioned in their job-seeker profiles from January 2018 through December 2018.¹¹ Cyber Security, Agile Software Development, and Amazon Web Services were among the most desired hard skills in job postings that were disproportionately mentioned in job-seeker profiles. These differences represent potential areas in which job applicants could align their hard skills more closely with their prospective employers' desired skills.

Table 10. Top 20 Desired Hard Skills for Engineering Graduates: 2018

Hard Skills	% of Job Postings Mentioning Skill	% of Job Seeker Profiles Mentioning Skill	Difference in Percentage
Cyber Security	20	2	-18
Top Secret-Sensitive Compartmented Info. (TS/SCI Clearance)	15	0	-15
Agile Software Development	24	10	-14
Amazon Web Services	13	3	-10
Python (Programming Language)	15	6	-9
DevOps	9	1	-8
Software Engineering	21	14	-7
Application Programming Interface	9	3	-6
Information Systems	14	8	-6
Systems Engineering	21	15	-6
Web Services	13	7	-6
Linux	16	12	-4
Scripting	11	9	-2
Cascading Style Sheets (CSS)	10	9	-1
JavaScript (Programming Language)	17	16	-1
Operating Systems	13	12	-1
Software Development	17	18	1
Java (Programming Language)	23	25	2
HyperText Markup Language (HTML)	9	16	7
SQL (Programming Language)	16	29	13

Figure 7. Top 20 Desired Hard Skills for Engineering Graduates: Percentage Mentioned in Job Postings and Job Seeker Profiles in 2018



¹¹ Hard skills are defined as technical or specialized skills often acquired through formal education.

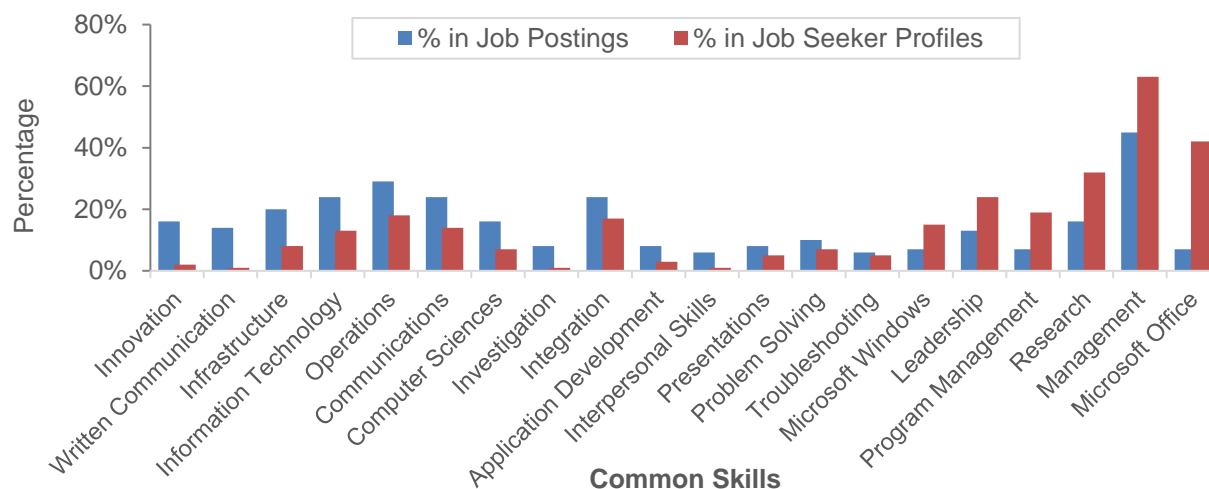
Desired Common Skills

Table 11 and Figure 8 (below) show disproportions between the top *common* skills that NOVA region employers sought among their job applicants and the common skills that Engineering (A.S. and B.S.) graduates mentioned in their job-seeker profiles from January 2018 through December 2018.¹² Innovation, written communication, and infrastructure were among the most desired common skills in job postings that were disproportionately mentioned in job-seeker profiles. These differences represent potential areas in which job applicants could align their common skills more closely with their prospective employers' desired skills.

Table 11. Top 20 Desired Common Skills for Engineering Graduates: 2018

Common Skills	% of Job Postings Mentioning Skill	% of Job Seeker Profiles Mentioning Skill	Difference in Percentage
Innovation	16	2	-14
Written Communication	14	1	-13
Infrastructure	20	8	-12
Information Technology	24	13	-11
Operations	29	18	-11
Communications	24	14	-10
Computer Sciences	16	7	-9
Investigation	8	1	-7
Integration	24	17	-7
Application Development	8	3	-5
Interpersonal Skills	6	1	-5
Presentations	8	5	-3
Problem Solving	10	7	-3
Troubleshooting (Problem Solving)	6	5	-1
Microsoft Windows	7	15	8
Leadership	13	24	11
Program Management	7	19	12
Research	16	32	16
Management	45	63	18
Microsoft Office	7	42	35

Figure 8. Top 20 Desired Common Skills for Engineering Graduates: Percentage Mentioned in Job Postings and Job Seeker Profiles in 2018



¹² Common skills refer to soft and transferable skills broadly utilized in various professions.

Desired Qualifications

Top desired qualifications for Engineering (A.S. and B.S.) graduates in NOVA region job postings from January 2018 through December 2018 included Certified Information Systems Security Professional (11,576 postings) and CompTIA Security+ (6,152 postings) (Table 12).

Table 12. Top 20 Desired Qualifications Posted for Engineering Graduates: 2018

Job Qualifications	# of Job Postings
Certified Information Systems Security Professional	11,576
CompTIA Security+	6,152
GIAC Certifications	5,494
Certified Ethical Hacker	3,832
Certified Information Security Manager	3,031
IAT Level II Certification	2,745
Certified Information System Auditor (CISA)	2,409
GIAC Certified Incident Handler	1,886
Cisco Certified Network Associate	1,719
GIAC Security Essentials Certification	1,632
Microsoft Certified Systems Engineer	1,599
Professional Engineer	1,580
Systems Security Certified Practitioner	1,522
ITIL Certifications	1,299
Project Management Professional Certification	1,278
Cisco Certified Network Professional	1,188
Cisco Certified Network Associate Security (CCNA Security)	1,144
CompTIA Advanced Security Practitioner	1,095
Certified Benefits Professional	1,088
IAT Level III Certification	1,049

Job Posting Sources

From January 2018 through December 2018, the top job postings website sources for target occupations for Engineering (A.S. and B.S.) graduates in the NOVA region were Nexxt.com (36,289 postings), Jobserve.com (18,972 postings), and My.jobs (18,472 postings) (Table 13).

Table 13. Top 20 Job Posting Sources for Target Occupations in NOVA Region: 2018

Website	# of Target Job Postings on Website
Nexxt.com	36,289
Jobserve.com	18,972
My.jobs	18,472
Dice.com	17,946
Employmentcrossing.com	17,539
Clearancejobs.com	16,419
Virginiajobnetwork.com	15,697
Careerboard.com	14,271
Geebo.com	13,949
Bluecollarcrossing.com	9,518
Careerbuilder.com	8,628
Jobs.net	8,469
Monster.com	8,098
Beyond.com	7,694
Recruitenetworks.com	6,805
Jobing.com	6,672
Resume-library.com	6,651
Washingtonpost.com	6,637
Americasjobexchange.com	5,009
Glassdoor.com	4,624