

Guided Pathway Study Series: 1 of 8

**Labor Market and Completion Data:
Physical Science, Engineering, and
Applied Technologies Programs**

Research Report No. 64-16

Office of Institutional Effectiveness and Student Success Initiatives

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OFFICE OF INSTITUTIONAL EFFECTIVENESS AND STUDENT SUCCESS INITIATIVES

The purpose of the Office of Institutional Effectiveness and Student Success Initiatives is to conduct analytical studies and provide information in support of institutional planning, policy formulation, and decision making. In addition, the office provides leadership and support in research related activities to members of the NOVA community engaged in planning and evaluating the institution's success in accomplishing its mission.

When citing data from this report, the Northern Virginia Community College (NOVA) Office of Institutional Effectiveness and Student Success Initiatives must be cited as the source.

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Physical Science, Engineering and Applied Technologies Programs

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Physical Science, Engineering, and Applied Technologies Programs

Introduction

This Report presents NOVA, regional, and national academic program and occupational data related to Physical Science, Engineering, and Applied Technologies programs at NOVA. Regional data includes the following nine locations: Arlington County, Fairfax County, Loudoun County, Prince William County, Stafford County, Alexandria City, Fairfax City, Falls Church City, Manassas City, and Manassas Park City.

Every postsecondary degree/certificate program in the U.S. falls under a six-digit Classification of Instructional Programs (CIP) Code as developed by the U.S. Department of Education's National Center for Education Statistics (NCES). The purpose of the CIP Code is to provide a taxonomic scheme that will support the accurate tracking, assessment, and reporting of fields of study and program completions activity.¹ A list of NOVA programs and their corresponding CIP codes is provided in the Appendix of this report.

All NOVA degree and certificate programs have been grouped into the following eight Guided Pathways: Biology and Biotechnology; Business; Health Sciences; Information Technology, Computer Science, and Mathematics; Liberal Arts and Social Science; Physical Science, Engineering, and Applied Technologies; Public Service, Social Service, and Education; and Visual and Performing Arts, Digital Media, and Design Programs.

Within this report on the Physical Science, Engineering, and Applied Technologies Guided Pathway, there are 14 sections in two parts. Six tables are presented for each section in this report. The first table of each section presents data on NOVA completions. The second through sixth tables present data related to the CIP Code that corresponds to the program(s) in that section.

NOVA Program Data

- **Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015**
 - Table 1 presents five-year trends in degree or certificate completion at NOVA by NOVA program and specialization.

Data by Program (CIP) Code

- **Table 2. Five-Year Completion Trends: 2011 through 2015**
 - Table 2 presents five-year trends in degree or certificate completion at NOVA, in the Northern Virginia region, and at the state and national levels.
- **Table 3. Regional Completions by Award: 2015**

¹<https://nces.ed.gov/pubs2002/cip2000/>

- Table 3 presents the number and percentage of completions in the Northern Virginia region by award level (Associate's degree, Bachelor's degree, Master's degree, etc.) in 2015.
- **Table 4. Regional Completions by Institution and Award: 2015**
 - Table 4 presents all completions in the Northern Virginia region by institution and award level in 2015.
- **Table 5. Five-Year Projections for Target Occupations: 2016 through 2021**
 - Table 5 presents workforce data and five-year projections for occupations related to the academic program and includes the number of jobs in each occupation in 2016, annual openings, median hourly earnings, projected growth from 2016 to 2021, and the Location Quotient of each occupation.
 - The **Location Quotient** is 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 in question.
- **Table 6. National Educational Attainment of Target Occupations: 2016**
 - Table 6 breaks down each target occupation by the highest degree attained by workers in that occupation in 2016.

Data Note

Data were extracted utilizing the Economic Modeling Specialists International (EMSI) product EMSI Analyst, which compiles data from over 90 sources, including the Integrated Postsecondary Education Data System (IPEDS), the U.S. Census Bureau, the Bureau of Labor Statistics, and the Internal Revenue Service. The data were pulled between November 1st and November 8th, 2016. More information on EMSI can be found at www.economicmodeling.com/data.

Part 1. Applied Technologies Programs

Program: Architecture Technology, A.A.S.

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Architecture Technology, A.A.S.	15	25	66.7%
NOVA Completions	15	25	66.7%

Trends for CIP Code: Architectural Technology/Technician (04.0901)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	15	25	66.7%
Region	15	25	66.7%
State	19	32	68.4%
Nation	762	764	0.3%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Associate's Degree	25	100.0%
Total	25	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Associate's Degree		Total	
	#	%	#	%
NOVA	25	100.0%	25	100.0%
Total	25	100.0%	25	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Architectural and Civil Drafters	945	17	\$25.03	-0.8%	1.13
Regional	945	17	\$25.03	-0.8%	1.13
National	97,472	1,213	\$24.72	0.0%	1.00

*See Introduction for explanation of Location Quotient

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Architectural and Civil Drafters	1.2%	10.2%	28.4%	33.2%	21.8%	3.9%	1.3%

Applied Technologies Programs

Program: Architectural Drafting, Certificate

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Architectural Drafting, Certificate	9	9	0.0%
NOVA Completions	9	9	0.0%

Trends for CIP Code: Architectural Drafting and Architectural CAD/CADD (15.1303)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	9	9	0.0%
Region	18	13	-27.8%
State	18	13	-27.8%
Nation	1,870	1,230	-34.2%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	9	69.2%
Associate's Degree	4	30.8%
Total	13	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Associate's Degree		Total	
	#	%	#	%	#	%
NOVA	9	100.0%	0	0.0%	9	69.2%
Westwood College – Annandale	0	0.0%	4	100.0%	4	30.8%
Total	9	100.0%	4	100.0%	13	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Architectural and Civil Drafters	945	17	\$25.03	-0.8%	1.13
Regional	945	17	\$25.03	-0.8%	1.13
National	97,472	1,213	\$24.72	0.0%	1.00

*See Introduction for explanation of Location Quotient.

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Architectural and Civil Drafters	1.2%	10.2%	28.4%	33.2%	21.8%	3.9%	1.3%

**Programs: Air Conditioning and Refrigeration, A.A.S
Air Conditioning and Refrigeration, Certificate
HVAC-R and Facilities Services Technology, Career Studies Certificate**

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Air Conditioning and Refrigeration, A.A.S.	17	33	94.1%
Air Conditioning and Refrigeration, Certificate	17	18	5.9%
HVAC-R and Facilities Services Technology, Career Studies Certificate	11	29	163.6%
NOVA Completions	45	80	77.8%

Trends for CIP Code: Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician (47.0201)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	45	80	77.8%
Region	81	145	79.0%
State	512	561	9.6%
Nation	20,728	18,019	-13.1%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	112	77.2%
Associate's Degree	33	22.8%
Total	145	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Associate's Degree		Total	
	#	%	#	%	#	%
NOVA	47	42.0%	33	100.0%	80	55.2%
Center for Employment Training – Alexandria	65	58.0%	0	0.0%	65	44.8%
Total	112	100.0%	33	100.0%	145	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,705	150	\$29.88	16.2%	1.09
Regional	2,705	150	\$29.88	16.2%	1.09
National	289,048	9,135	\$22.15	7.8%	1.00

*See introduction for explanation of Location Quotient.

Applied Technologies Programs

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	11.7%	39.5%	30.9%	13.0%	4.1%	0.5%	0.2%

**Programs: Automotive Technology, A.A.S (incl. specializations)
Automotive Maintenance and Light Repair, Career Studies Certificate
Collision Repair Technology, Career Studies Certificate**

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Automotive Technology, A.A.S.	23	26	13.0%
Automotive Technology/Emissions Specialization, A.A.S.	6	5	-16.7%
Automotive Maintenance and Light Repair, Career Studies Certificate	10	12	20.0%
Collision Repair Technology, Career Studies Certificate	3	6	100.0%
NOVA Completions	42	49	16.7%

**Trends for CIP Code: Automobile/Automotive Mechanics
Technology/Technician (47.0604)**

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	61	52	-14.8%
Region	61	52	-14.8%
State	529	551	4.2%
Nation	39,706	38,004	-4.3%

Note: This CIP code encompasses discontinued NOVA programs not included in this Guided Pathway.

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	21	40.4%
Associate's Degree	31	59.6%
Total	52	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Associate's Degree		Total	
	#	%	#	%	#	%
NOVA	21	100.0%	31	100.0%	52	100.0%
Total	21	100.0%	31	100.0%	52	100.0%

Applied Technologies Programs

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Automotive Service Technicians and Mechanics	5,830	232	\$24.75	5.4%	1.03
Electronic Equipment Installers and Repairers, Motor Vehicles	169	3	\$17.72	-17.8%	1.63
Electrical and Electronics Installers and Repairers, Transportation Equipment	112	3	\$33.30	1.8%	1.33
Regional	6,111	238	\$24.71	4.7%	1.05**
National	677,631	21,582	\$18.59	2.2%	1.00

*See Introduction for explanation of Location Quotient

**Weighted average of the Location Quotients for all Target Occupations

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Automotive Service Technicians and Mechanics	18.6%	44.1%	22.4%	11.0%	3.4%	0.4%	0.1%
Electronic Equipment Installers and Repairers, Motor Vehicles	17.7%	38.1%	28.3%	10.2%	5.4%	0.4%	0.0%
Electrical and Electronics Installers and Repairers, Transportation Equipment	1.6%	32.0%	35.1%	21.7%	9.0%	0.6%	0.0%

Applied Technologies Programs

Program: Diesel Mechanics Technology, Career Studies Certificate

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Diesel Mechanics Technology, Career Studies Certificate	1	0	--
NOVA Completions	1	0	--

Trends for CIP Code: Diesel Mechanics Technology/Technician (47.0605)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	1	0	-100.0%
Region	1	0	-100.0%
State	99	101	2.0%
Nation	8,981	9,334	3.9%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	0	0.0%
Total	0	0.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Total	
	#	%	#	%
NOVA	0	0.0%	0	0.0%
Total	0	0.0%	0	0.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Bus and Truck Mechanics and Diesel Engine Specialists	1,003	44	\$26.08	12.5%	0.46
Regional	1,003	44	\$26.08	12.5%	0.46
National	253,927	8,590	\$21.70	7.9%	1.00

*See Introduction for explanation of Location Quotient.

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Bus and Truck Mechanics and Diesel Engines Specialists	14.2%	47.2%	24.6%	10.2%	3.3%	0.5%	0.0%

**Programs: Construction Management Technology, A.A.S.
Construction Supervision, Career Studies Certificate**

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Construction Management Technology, A.A.S.	7	14	100.0%
Construction Supervision, Career Studies Certificate	3	11	266.7%
NOVA Completions	10	25	150.0%

Trends for CIP Code: Construction Trades, General (46.0000)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	10	25	150.0%
Region	10	25	150.0%
State	114	69	-39.5%
Nation	1,205	1,920	59.3%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	11	44.0%
Associate's Degree	14	56.0%
Total	25	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Associate's Degree		Total	
	#	%	#	%	#	%
NOVA	11	100.0%	14	100.0%	25	100.0%
Total	11	100.0%	14	100.0%	25	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
First-Line Supervisors of Construction Trades and Extraction Workers	5,567	135	\$34.35	7.3%	1.24
Carpenters	5,555	155	\$22.71	6.9%	0.97
Electricians	5,077	222	\$27.79	6.7%	0.96
Plumbers, Pipefitters, and Steamfitters	3,119	167	\$27.84	16.8%	0.89

Applied Technologies Programs

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Operating Engineers and Other Construction Equipment Operators	2,482	90	\$22.59	9.1%	0.82
Painters, Construction and Maintenance	1,980	54	\$19.94	1.1%	1.03
Construction Managers	1,891	58	\$48.73	7.4%	0.90
Cement Masons and Concrete Finishers	1,732	52	\$22.09	5.3%	1.19
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	874	41	\$16.09	13.3%	1.74
Helpers--Electricians	856	37	\$15.03	6.7%	1.32
Helpers--Carpenters	844	23	\$14.60	5.9%	2.50
Drywall and Ceiling Tile Installers	804	15	\$20.13	-12.8%	1.01
Sheet Metal Workers	661	36	\$25.33	13.5%	0.55
Roofers	630	35	\$23.91	18.6%	0.64
Brickmasons and Blockmasons	535	12	\$25.47	-17.2%	0.98
Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	420	7	\$16.14	-21.7%	2.08
Pipelayers	403	13	\$19.74	7.9%	1.14
Tile and Marble Setters	386	11	\$22.82	3.4%	1.21
Glaziers	350	8	\$23.94	-1.7%	0.87
Paving, Surfacing, and Tamping Equipment Operators	326	17	\$18.88	13.8%	0.72
Helpers, Construction Trades, All Other	320	7	\$17.09	2.8%	1.86
Stonemasons	312	4	\$29.09	-18.6%	2.61
Structural Iron and Steel Workers	283	8	\$26.13	4.2%	0.49
Helpers--Roofers	238	9	\$15.40	11.3%	2.49
Reinforcing Iron and Rebar Workers	198	8	\$24.32	11.1%	1.08
Insulation Workers, Mechanical	195	12	\$23.51	11.3%	0.76
Insulation Workers, Floor, Ceiling, and Wall	154	7	\$18.27	-10.4%	0.67
Floor Layers, Except Carpet, Wood, and Hard Tiles	56	2	\$18.80	8.9%	0.63
Tapers	51	1	\$18.71	-13.7%	0.32
Carpet Installers	44	1	\$13.87	6.8%	0.19
Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	31	1	\$15.07	3.2%	0.32
Boilermakers	30	2	\$31.45	23.3%	0.22
Plasterers and Stucco Masons	21	1	\$29.87	19.0%	0.10
Floor Sanders and Finishers	15	1	\$21.63	6.7%	0.35

Applied Technologies Programs

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Terrazzo Workers and Finishers	13	0	\$28.30	7.7%	0.46
Pile-Driver Operators	10	1	\$28.29	20.0%	0.33
Paperhangers	9	0	\$15.83	2.9%	0.65
Regional	36,473	1,253	\$26.16	6.6%	1.09**
National	4,285,967	96,092	\$24.47	3.9%	1.00

*See Introduction for explanation of Location Quotient

**Weighted average of the Location Quotients for all Target Occupations

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
First-Line Supervisors of Construction Trades and Extraction Workers	13.7%	42.0%	25.8%	7.0%	9.6%	1.4%	0.4%
Carpenters	24.6%	43.1%	20.7%	5.2%	5.5%	0.8%	0.1%
Electricians	7.7%	37.3%	33.0%	14.3%	6.6%	0.8%	0.2%
Plumbers, Pipefitters, and Steamfitters	15.8%	48.4%	24.5%	6.9%	3.7%	0.5%	0.1%
Operating Engineers and Other Construction Equipment Operators	19.7%	52.8%	19.5%	4.8%	2.8%	0.3%	0.1%
Painters, Construction and Maintenance	33.4%	39.4%	16.8%	3.7%	5.7%	0.8%	0.1%
Construction Managers	6.9%	26.3%	24.3%	8.5%	27.9%	5.3%	0.8%
Cement Masons and Concrete Finishers	45.6%	36.9%	12.8%	2.4%	2.1%	0.1%	0.0%
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	43.9%	36.0%	11.5%	4.3%	4.0%	0.4%	0.0%
Helpers--Electricians	43.9%	36.0%	11.5%	4.3%	4.0%	0.4%	0.0%
Helpers--Carpenters	43.9%	36.0%	11.5%	4.3%	4.0%	0.4%	0.0%
Drywall and Ceiling Tile Installers	43.0%	38.4%	13.4%	2.0%	3.0%	0.2%	0.0%
Sheet Metal Workers	14.7%	46.5%	27.5%	6.9%	4.1%	0.4%	0.0%
Roofers	45.6%	37.6%	11.0%	2.7%	2.8%	0.3%	0.1%
Brickmasons and Blockmasons	34.1%	42.2%	15.8%	4.2%	3.3%	0.3%	0.1%
Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	43.9%	36.0%	11.5%	4.3%	4.0%	0.4%	0.0%
Pipelayers	15.8%	48.4%	24.5%	6.9%	3.7%	0.5%	0.1%
Tile and Marble Setters	36.3%	41.6%	15.2%	3.6%	2.8%	0.4%	0.1%
Glaziers	19.7%	53.0%	19.8%	3.7%	3.5%	0.3%	0.0%

Applied Technologies Programs

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Paving, Surfacing, and Tamping Equipment Operators	36.7%	51.8%	5.8%	2.4%	3.3%	0.0%	0.0%
Helpers, Construction Trades, All Other	43.9%	36.0%	11.5%	4.3%	4.0%	0.4%	0.0%
Stonemasons	34.1%	42.2%	15.8%	4.2%	3.3%	0.3%	0.1%
Structural Iron and Steel Workers	16.7%	46.0%	24.3%	6.9%	5.7%	0.1%	0.3%
Helpers--Roofers	43.9%	36.0%	11.5%	4.3%	4.0%	0.4%	0.0%
Reinforcing Iron and Rebar Workers	34.1%	42.2%	15.8%	4.2%	3.3%	0.3%	0.1%
Insulation Workers, Mechanical	27.6%	40.0%	22.6%	5.5%	3.1%	0.5%	0.6%
Insulation Workers, Floor, Ceiling, and Wall	27.6%	40.0%	22.6%	5.5%	3.1%	0.5%	0.6%
Floor Layers, Except Carpet, Wood, and Hard Tiles	36.3%	41.6%	15.2%	3.6%	2.8%	0.4%	0.1%
Tapers	43.0%	38.4%	13.4%	2.0%	3.0%	0.2%	0.0%
Carpet Installers	36.3%	41.6%	15.2%	3.6%	2.8%	0.4%	0.1%
Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	43.9%	36.0%	11.5%	4.3%	4.0%	0.4%	0.0%
Boilermakers	9.6%	48.8%	30.9%	7.5%	2.5%	0.4%	0.3%
Plasterers and Stucco Masons	52.2%	32.6%	12.3%	2.2%	0.5%	0.2%	0.0%
Floor Sanders and Finishers	36.3%	41.6%	15.2%	3.6%	2.8%	0.4%	0.1%
Terrazzo Workers and Finishers	45.6%	36.9%	12.8%	2.4%	2.1%	0.1%	0.0%
Pile-Driver Operators	19.7%	52.8%	19.5%	4.8%	2.8%	0.3%	0.1%
Paperhangers	33.4%	39.4%	16.8%	3.7%	5.7%	0.8%	0.1%

Program: Engineering Technology, A.A.S. (incl. specializations)

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Engineering Technology, A.A.S.	0	1	--
Engineering Technology/Civil Engineering Technology Specialization, A.A.S.	3	5	66.7%
Engineering Technology/Drafting Specialization, A.A.S.	1	1	0.0%
Engineering Technology/Mechanical Engineering Technology Specialization, A.A.S.	2	3	50.0%
NOVA Completions	6	10	66.7%

Trends for CIP Code: Engineering Technology, General (15.0000)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	6	10	66.7%
Region	6	10	66.7%
State	67	68	1.5%
Nation	3,499	3,392	-3.1%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Associate's Degree	10	100.0%
Total	10	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Associate's Degree		Total	
	#	%	#	%
NOVA	10	100.0%	10	100.0%
Total	10	100.0%	10	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Electrical and Electronics Engineering Technicians	2,045	63	\$35.02	-0.8%	1.68
Mechanical Engineering Technicians	671	23	\$29.31	2.4%	1.57
Civil Engineering Technicians	670	27	\$21.46	5.1%	1.07
Surveying and Mapping Technicians	585	8	\$24.54	-2.7%	1.26

Applied Technologies Programs

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Engineering Technicians, Except Drafters, All Other	517	18	\$41.71	4.5%	0.82
Industrial Engineering Technicians	127	5	\$28.72	-0.8%	0.23
Environmental Engineering Technicians	123	10	\$28.51	27.6%	0.81
Electro-Mechanical Technicians	117	4	\$26.35	-3.4%	0.91
Aerospace Engineering and Operations Technicians	51	3	\$34.10	13.7%	0.44
Regional	4,906	161	\$31.32	1.5%	1.35**
National	499,512	14,252	\$26.70	2.3%	1.00

*See Introduction for explanation of Location Quotient

**Weighted average of the Location Quotients for all Target Occupations

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Electrical and Electronics Engineering Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%
Mechanical Engineering Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%
Civil Engineering Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%
Surveying and Mapping Technicians	4.5%	26.5%	37.9%	20.6%	9.3%	1.2%	0.1%
Engineering Technicians, Except Drafters, All Other	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%
Industrial Engineering Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%
Environmental Engineering Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%
Electro-Mechanical Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%
Aerospace Engineering and Operations Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%

Program: Computer Aided Drafting and Design, Career Studies Certificate

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Computer Aided Drafting and Design, Career Studies Certificate	23	21	-8.7%
NOVA Completions	23	21	-8.7%

Trends for CIP Code: CAD/CADD Drafting and/or Design Technology/Technician (15.1302)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	23	21	-8.7%
Region	81	21	-74.1%
State	319	109	-65.8%
Nation	5,263	2,549	-51.6%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	21	100.0%
Total	21	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Total	
	#	%	#	%
NOVA	21	100.0%	21	100.0%
Total	21	100.0%	21	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Architectural and Civil Drafters	945	17	\$25.03	-0.8%	1.13
Regional	945	17	\$25.03	-0.8%	1.13
National	97,472	1,213	\$24.72	0.0%	1.00

*See Introduction for explanation of Location Quotient

Applied Technologies Programs

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Architectural and Civil Drafters	1.2%	10.2%	28.4%	33.2%	21.8%	3.9%	1.3%

Program: Electronic Media in Design Rendering and Animation, Career Studies Certificate

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Electronic Media in Design Rendering and Animation, Career Studies Certificate [†]	0	1	--
NOVA Completions	0	1	--

[†]Discontinued in Fall 2016.

Trends for CIP Code: Design and Visual Communications, General (50.0401)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	0	1	100.0%
Region	79	45	-43.0%
State	288	225	-21.9%
Nation	6,260	5,744	-8.2%

Note: This CIP code encompasses other NOVA programs not included in this Guided Pathway

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	2	4.4%
Associate's Degree	43	95.6%
Total	45	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Associate's Degree		Total	
	#	%	#	%	#	%
NOVA	2	100.0%	43	100.0%	45	100.0%
Total	2	100.0%	43	100.0%	45	100.0%

Table 5. Five-Year Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Graphic Designers	2,664	95	\$32.21	4.5%	1.47
Commercial and Industrial Designers	91	4	\$30.56	7.7%	0.32
Set and Exhibit Designers	77	3	\$32.32	5.2%	0.70
Designers, All Other	36	1	\$22.34	2.8%	0.61
Regional	2,868	103	\$32.04	4.6%	1.40**
National	263,028	7,118	\$24.44	1.5%	1.00

*See Introduction for explanation of Location Quotient

**Weighted average of the Location Quotients for all Target Occupations

Applied Technologies Programs

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Graphic Designers	2.3%	9.8%	17.6%	12.7%	47.4%	8.7%	1.4%
Commercial and Industrial Designers	2.3%	9.8%	17.6%	12.7%	47.4%	8.7%	1.4%
Set and Exhibit Designers	2.3%	9.8%	17.6%	12.7%	47.4%	8.7%	1.4%
Designers, All Other	2.3%	9.8%	17.6%	12.7%	47.4%	8.7%	1.4%

Program: Site Development, Career Studies Certificate

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Site Development, Career Studies Certificate	1	0	--
NOVA Completions	1	0	--

Trends for CIP Code: Civil Engineering Technology/Technician (15.0201)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	1	0	-100.0%
Region	1	0	-100.0%
State	19	16	-15.8%
Nation	1,889	1,477	-21.8%

Note: This CIP code encompasses other NOVA programs not included in this Guided Pathway.

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	0	0.0%
Total	0	0.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Total	
	#	%	#	%
NOVA	0	0.0%	0	0.0%
Total	0	0.0%	0	0.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Civil Engineering Technicians	670	27	\$21.46	5.1%	1.07
Regional	670	27	\$21.46	5.1%	1.07
National	72,858	2,568	\$24.14	5.0%	1.00

*See Introduction for explanation of Location Quotient

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Civil Engineering Technicians	4.0%	22.6%	33.5%	21.6%	15.2%	2.6%	0.5%

Program: Geographic Information Systems, Career Studies Certificate

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Geographic Information Systems, Career Studies Certificate	8	10	25.0%
NOVA Completions	8	10	25.0%

Trends for CIP Code: Surveying Engineering (14.3801)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	8	10	25.0%
Region	8	10	25.0%
State	10	24	140.0%
Nation	99	68	-31.3%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	10	100.0%
Total	10	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Total	
	#	%	#	%
NOVA	10	100.0%	10	100.0%
Total	10	100.0%	10	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Architectural and Engineering Managers	2,084	90	\$70.76	4.7%	1.32
Engineers, All Other	1,915	55	\$65.04	3.7%	1.70
Regional	3,999	145	\$68.02	4.2%	1.50**
National	314,426	10,685	\$57.24	3.6%	1.00

*See Introduction for explanation of Location Quotient

**Weighted average of the Location Quotients for all Target Occupations

Applied Technologies Programs

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Architectural and Engineering Managers	0.3%	3.9%	6.9%	4.3%	46.0%	33.4%	5.2%
Engineers, All Other	0.2%	2.2%	7.6%	6.7%	48.1%	28.0%	7.3%

Program: Welding: Basic Techniques, Career Studies Certificate

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Welding: Basic Techniques, Career Studies Certificate	1	13	1200.0%
NOVA Completions	1	13	1200.0%

Trends for CIP Code: Welding Technology/Welder (48.0508)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	1	13	1200.0%
Region	1	13	1200.0%
State	365	556	52.3%
Nation	24,638	35,454	43.9%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Certificate	13	100.0%
Total	13	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Certificate		Total	
	#	%	#	%
NOVA	13	100.0%	13	100.0%
Total	13	100.0%	13	100.0%

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Welders, Cutters, Solderers, and Brazers	688	31	\$25.03	5.8%	0.21
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	31	1	\$23.90	-9.7%	0.07
Regional	719	32	\$24.98	5.1%	0.20**
National	423,132	15,613	\$18.64	3.0%	1.00

*See Introduction for explanation of Location Quotient

**Weighted average of the Location Quotients for all Target Occupations

Applied Technologies Programs

Table 6. National Educational Attainment of Target Occupations

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Welders, Cutters, Solderers, and Brazers	21.3%	48.0%	21.8%	6.4%	2.2%	0.2%	0.1%
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	21.3%	48.0%	21.8%	6.4%	2.2%	0.2%	0.1%

Part 2. Physical Science and Engineering Programs

Program: Engineering, A.S. (incl. specializations)

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Engineering Technology, A.S.	68	86	26.5%
Engineering Technology/Electrical Engineering Specialization, A.S.	47	71	51.1%
NOVA Completions	115	157	36.5%

Trends for CIP Code: Engineering, General (14.0101)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	115	157	36.5%
Region	124	161	29.8%
State	518	677	30.7%
Nation	6,970	7,709	10.6%

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Associate's Degree	157	97.5%
Postbaccalaureate Certificate	4	2.5%
Total	161	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Associate's Degree		Post-Baccalaureate Certificate		Total	
	#	%	#	%	#	%
NOVA	157	100.0%	0	0.0%	157	97.5%
George Mason University	0	0.0%	4	100.0%	4	2.5%
Total	157	100.0%	4	100.0%	161	100.0%

Physical Science and Engineering Programs

Table 5. Projections for Target Occupations: 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Architectural and Engineering Managers	2,084	90	\$70.76	4.7%	1.32
Engineers, All Other	1,915	55	\$65.04	3.7%	1.70
Regional	3,999	145	\$68.02	4.2%	1.50**
National	314,426	10,685	\$57.24	3.6%	1.00

*See Introduction for explanation of Location Quotient

**Weighted average of the Location Quotients for all Target Occupations

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Architectural and Engineering Managers	0.3%	3.9%	6.9%	4.3%	46.0%	33.4%	5.2%
Engineers, All Other	0.2%	2.2%	7.6%	6.7%	48.1%	28.0%	7.3%

Physical Science and Engineering Programs

Program: Science, A.S.

Table 1. Five-Year Completion Trends by NOVA Program: 2011 through 2015

NOVA Program	2011 Completions	2015 Completions	% Change
Science, A.S.	237	327	38.0%
NOVA Completions	237	327	38.0%

Trends for CIP Code: Biological and Physical Sciences (30.0101)

Table 2. Five-Year Completion Trends: 2011 through 2015

Location	2011 Completions	2015 Completions	% Change
NOVA	269	372	38.0%
Region	275	375	36.4%
State	913	1,274	39.5%
Nation	16,211	24,658	52.1%

Note: This CIP code encompasses other NOVA programs not included in this Guided Pathway

Table 3. Regional Completions by Award: 2015

Award Level	Completions	
	#	%
Associate's Degree	372	99.2%
Doctoral Degree	3	0.8%
Total	375	100.0%

Table 4. Regional Completions by Institution and Award: 2015

Institution	Associate's Degree		Doctoral Degree		Total	
	#	%	#	%	#	%
NOVA	372	100.0%	0	0.0%	372	99.2%
George Mason University	0	0.0%	3	100.0%	3	0.8%
Total	372	100.0%	3	100.0%	375	100.0%

Table 5. Projections for Target Occupation(s): 2016 through 2021

Occupation	2016 Jobs	Annual Openings	Median Hourly Earnings	Projected Growth (2016–2021)	Location Quotient (2016)*
Natural Science Managers	798	24	\$63.04	4.3%	1.65
Regional	798	24	\$63.04	4.3%	1.65*
National	56,107	1,689	\$60.00	4.4%	1.00

*See Introduction for explanation of Location Quotient

Physical Science and Engineering Programs

Table 6. National Educational Attainment of Target Occupations: 2016

Occupation	< High School Diploma	High School Diploma or Equivalent	Some College, No Degree	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
Natural Science Managers	0.6%	1.4%	4.0%	2.3%	33.2%	31.4%	27.2%

Appendix

Appendix Table 1. CIP Codes, NOVA Programs, and NOVA Completions: 2011 and 2015

CIP Code		NOVA		
CIP Code	Description	NOVA Program	2011 Completions	2015 Completions
01.0601	Applied Horticulture/Horticulture Operations, General	Horticulture Technology, A.A.S.	0	5
		Horticulture Technology/Landscape Design Specialization, A.A.S.	5	1
04.0901	Architectural Technology/Technician	Architecture Technology, A.A.S.	15	25
10.0299	Audiovisual Communications Technologies/Technicians, Other	Music Recording Technology, Certificate	4	6
11.0101	Computer and Information Sciences, General	Information Systems Technology, A.A.S.	49	69
		Application Programming, CSC	1	12
		Database Specialist, CSC	2	22
		IT Technical Support, CSC	7	23
11.0103	Information Technology	Information Technology, A.S.	278	362
11.0701	Computer Science	Computer Science, A.S.	61	135
11.0801	Web Page, Digital/Multimedia and Information Resources Design	Web Design and Development, CSC	2	13
		Web Design Specialist, CSC	12	9
11.1003	Computer and Information Systems Security/Information Assurance	CyberSecurity, A.A.S.	--	4
12.0500	Cooking and Related Culinary Arts, General	Culinary Arts, Certificate	8	10
13.1501	Teacher Assistant/Aide	Paraprofessional Teacher Assistant, CSC [†]	9	8
14.0101	Engineering, General	Engineering, A.S.	68	86
		Engineering/Electrical Engineering Specialization, A.S.	47	71
14.3801	Surveying Engineering	Geographic Information Systems (GIS), CSC	8	10
15.0000	Engineering Technology, General	Engineering Technology, A.A.S.	0	1
		Engineering Technology/Civil Engineering Technology Specialization, A.A.S.	3	5

CIP Code		NOVA		
CIP Code	Description	NOVA Program	2011 Completions	2015 Completions
		Engineering Technology/Drafting Specialization, A.A.S.	1	1
		Engineering Technology/Mechanical Engineering Technology Specialization, A.A.S.	2	3
15.0201	Civil Engineering Technology/Technician	Site Development, CSC (formerly Land Planning, Survey, and Development)	1	0
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician	Cybersecurity, CSC (formerly Network Security)	5	35
		Network Administration, CSC	7	15
		Network Engineering (Specialist), CSC	8	26
15.1302	CAD/CADD Drafting and/or Design Technology/Technician	Computer Aided Drafting and Design, CSC	23	21
15.1303	Architectural Drafting and Architectural CAD/CADD	Architectural Drafting, Certificate	9	9
16.1603	Sign Language Interpretation and Translation	American Sign Language to English Interpretation, A.A.S.	8	8
		American Sign Language, CSC	10	10
19.0709	Child Care Provider/Assistant	Early Childhood Development, A.A.S.	28	57
		Early Childhood Development/School-Age Child Specialization, A.A.S.†	1	5
		Early Childhood Development, Certificate	35	35
		Early Childhood Development, CSC	20	71
		Infant and Toddler Care, CSC	9	12
22.0302	Legal Assistant/Paralegal	Paralegal Studies, A.A.S.	40	41
23.1303	Professional, Technical, Business, and Scientific Writing	Professional Writing, Certificate	3	2
24.0102	General Studies	General Studies, A.S.	1,131	1,468
		General Studies/Recreation, Parks, and Leisure Studies Specialization, A.S.	6	8
24.0103	Humanities/Humanistic Studies	Liberal Arts, A.A.	367	321
		Liberal Arts/Art History Specialization, A.A.	3	2
		Liberal Arts/Communication Studies Specialization, A.A.	19	22
		Liberal Arts/English Specialization, A.A.	--	3
		Liberal Arts/International Studies Specialization, A.A.	47	33

CIP Code		NOVA		
CIP Code	Description	NOVA Program	2011 Completions	2015 Completions
		Liberal Arts/Psychology Specialization, A.A.	39	34
		African-American Studies, CSC†	0	0
		Chinese Studies, CSC†	2	0
		Japanese Studies, CSC†	2	2
		Latin American Studies, CSC†	2	6
		Public History and Historic Preservation, CSC (formerly Historic Preservation)	7	2
24.0199	Liberal Arts and Sciences, General Studies and Humanities, Other	General Education, Certificate	1,142	890
30.0101	Biological and Physical Sciences	Science, A.S.	237	327
		Science/Mathematics Specialization, A.S.	31	45
31.0301	Parks, Recreation and Leisure Facilities Management, General	Fitness, CSC	7	18
		Outdoor Recreation and Resource Management, CSC	0	0
		Recreation Programming and Administration, CSC	1	0
41.0101	Biology Technician/Biotechnology Laboratory Technician	Biotechnology, A.A.S.	1	9
		Biotechnology Lab Technician, CSC	0	5
43.0103	Criminal Justice/Law Enforcement Administration	Administration of Justice, A.A.S.	61	89
		Administration of Justice, Certificate	22	20
		National Security, CSC	0	7
		Security Management, CSC	1	1
43.0106	Forensic Science and Technology	Forensic Investigation (Advanced), CSC	1	2
		Forensic Investigation (General), CSC	7	3
43.0203	Fire Science/Fire-fighting	Fire Science Technology, A.A.S.	1	2
45.0101	Social Sciences, General	Social Sciences, A.S.	323	391
		Social Sciences/Deaf Studies Specialization, A.S.	3	2
		Social Sciences/Geospatial Specialization, A.S.	--	2
		Social Sciences/Political Science Specialization, A.S.	3	31
		Social Sciences/Psychology Specialization, A.S.	102	138

CIP Code		NOVA		
CIP Code	Description	NOVA Program	2011 Completions	2015 Completions
		Social Sciences/Teacher Education Specialization, A.S.	59	99
		Drivers Education, CSC	3	1
46.0000	Construction Trades, General	Construction Management Technology, A.A.S.	7	14
		Construction Supervision, CSC	3	11
47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician.	Air Conditioning and Refrigeration, A.A.S.	17	33
		Air Conditioning and Refrigeration, Certificate	17	18
		HVAC-R and Facilities Services Technology, CSC	11	29
47.0604	Automobile/Automotive Mechanics Technology/Technician	Automotive Technology, A.A.S.	23	26
		Automotive Technology/Emissions Specialization, A.A.S.	6	5
		Automotive Maintenance and Light Repair, CSC	10	12
		Collision Repair Technology, CSC	3	6
47.0605	Diesel Mechanics Technology/Technician	Diesel Mechanics Technology, CSC	1	0
48.0508	Welding Technology/Welder	Welding: Basic Techniques, CSC	1	13
50.0101	Visual and Performing Arts, General	Fine Arts, A.A.	50	35
		Music, A.A.	4	6
		Music, A.A.A.	9	7
		Music/Jazz/Popular Music Specialization, A.A.A.	2	0
		Theatre, CSC	4	2
50.0401	Design and Visual Communications, General	Communication Design, A.A.S.	23	26
		Communication Design/Interactive Design Specialization, A.A.S.	7	17
		Multimedia Design, Certificate	2	1
		Electronic Media in Design, Rendering, and Animation, CSC†	0	1
50.0408	Interior Design	Interior Design, A.A.S.	25	21
50.0605	Photography	Photography and Media, A.A.S.	13	13
50.9999	Visual and Performing Arts, Other	Fine Arts, A.A.A.	11	12
		Fine Arts/Photography Specialization, A.A.A.	4	2

CIP Code		NOVA		
CIP Code	Description	NOVA Program	2011 Completions	2015 Completions
51.0601	Dental Assisting/Assistant	Dental Assisting, Certificate	--	0
51.0602	Dental Hygiene/Hygienist	Dental Hygiene, A.A.S.	38	37
51.0707	Health Information/Medical Records Technology/Technician	Health Information Management, A.A.S.	24	7
		Clinical Data Coding, CSC	15	16
		Health Information Technology, CSC	--	3
51.0799	Health and Medical Administrative Services, Other	Medical Transcription, CSC†	0	0
51.0803	Occupational Therapist Assistant	Occupational Therapy Assistant, A.A.S.	--	12
51.0806	Physical Therapy Technician/Assistant	Physical Therapist Assistant, A.A.S.	30	29
51.0808	Veterinary/Animal Health Technology/Technician and Veterinary Assistant	Veterinary Technology, A.A.S.	34	46
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	Emergency Medical Services, A.A.S.	19	29
		Emergency Medical Technician–Basic, CSC	0	16
		Emergency Medical Technician–Intermediate, CSC	0	36
		Paramedic, CSC	0	24
51.0907	Medical Radiologic Technology/Science – Radiation Therapist	Radiation Oncology, A.A.S. (Distance degree program offered through Virginia Western Community College)	--	--
51.0908	Respiratory Care Therapy/Therapist	Respiratory Therapy, A.A.S.	15	21
51.0910	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician	Diagnostic Medical Sonography, A.A.S.	7	8
51.0911	Radiologic Technology/Science - Radiographer	Radiography, A.A.S.	39	30
51.0999	Allied Health Diagnostic, Intervention, and Treatment Professions, Other	Health Science, CSC	--	18
51.1004	Clinical/Medical Laboratory Technician	Medical Laboratory Technology, A.A.S.	15	16
		Phlebotomy, CSC	23	25

CIP Code		NOVA		
CIP Code	Description	NOVA Program	2011 Completions	2015 Completions
51.1501	Substance Abuse/Addiction Counseling	Substance Abuse Rehabilitation Counselor, Certificate	9	16
51.3501	Massage Therapy/Therapeutic Massage	Massage Therapy, CSC	17	20
51.3801	Registered Nursing/Registered Nurse	Nursing, A.A.S.	210	148
52.0201	Business Administration and Management, General	Business Administration, A.S.	897	1,006
52.0299	Business Administration, Management and Operations, Other	Business Management, A.A.S.	27	35
		Business Management/Finance Specialization, A.A.S.†	2	5
		Business Management/Healthcare Administration Specialization, A.A.S.†	0	4
		Business Management/International Business Specialization, A.A.S.†	5	4
		Business Management/Public Management Specialization, A.A.S.†	0	0
		Contract Management, A.A.S.	4	5
		Marketing, A.A.S.	4	2
		Marketing/Digital Marketing Specialization, A.A.S.† (formerly e-Commerce Specialization)	0	1
		Marketing/International Marketing Specialization, A.A.S.†	1	1
		Marketing/Public Relations Specialization, A.A.S.†	1	4
		Contract Management, Certificate	12	6
		Business Information Technology, CSC	56	158
		Entrepreneurship, CSC	0	2
		Leadership Development, CSC	5	9
		Marketing, CSC	4	6
		Promotion and Public Relations, CSC	3	6
Retail Management, CSC	2	3		
Social Media Marketing, CSC (formerly e-Commerce)	7	9		
52.0399	Accounting and Related Services, Other	Accounting, A.A.S.	32	37
		Bookkeeping, Certificate	34	37

CIP Code		NOVA		
CIP Code	Description	NOVA Program	2011 Completions	2015 Completions
		Accounting, CSC	35	47
52.0901	Hospitality Administration/Management, General	Hospitality Management, A.A.S.	13	18
		Hospitality Management/Food Service Management Specialization, A.A.S.	5	5
		Hospitality Management/Hotel Management Specialization, A.A.S.	4	4
		Hospitality Management/Nutrition Management Specialization, A.A.S.	7	3
		Meeting, Event, and Exhibition Management, Certificate	9	7
52.0903	Tourism and Travel Services Management	Travel and Tourism, A.A.S.	2	1
		Travel and Tourism, Certificate	7	2
		Tour Guiding, CSC	4	3
52.1501	Real Estate	Real Estate Brokerage, Certificate	0	1
		Real Estate Brokerage, CSC	0	1

Source: National Center for Education Statistics (NCES) list of Classification of Instructional Programs (CIP) Codes. <https://nces.ed.gov/ipeds/cipcode/>

Appendix Table 2. List of NOVA Programs by Guided Pathway

NOVA Programs by Guided Pathway
<p>1. Biology and Biotechnology Programs</p> <ul style="list-style-type: none"> • Biotechnology, A.A.S. <ul style="list-style-type: none"> ○ Biotechnology Lab Technician, Career Studies Certificate • Horticulture Technology, A.A.S. <ul style="list-style-type: none"> ○ Horticulture Technology, A.A.S./Landscape Design Specialization • Veterinary Technology, A.A.S.
<p>2. Business Programs</p> <ul style="list-style-type: none"> • Accounting A.A.S. <ul style="list-style-type: none"> ○ Accounting, Career Studies Certificate ○ Bookkeeping, Certificate • Business Administration, A.S. • Business Management, A.A.S. <ul style="list-style-type: none"> ○ Business Management, A.A.S./Finance Specialization[†] ○ Business Management, A.A.S./Healthcare Administration Specialization[†] ○ Business Management, A.A.S./International Business Specialization[†] ○ Business Management, A.A.S./Public Management Specialization[†] ○ Business Information Technology, Career Studies Certificate ○ Entrepreneurship, Career Studies Certificate ○ Leadership Development, Career Studies Certificate • Contract Management, A.A.S. <ul style="list-style-type: none"> ○ Contract Management, Certificate • Hospitality Management, A.A.S. <ul style="list-style-type: none"> ○ Hospitality Management, A.A.S./Food Service Management Specialization ○ Hospitality Management, A.A.S./Hotel Management Specialization ○ Hospitality Management, A.A.S. /Nutrition Management Specialization ○ Meeting, Event, and Exhibition Management, Certificate • Culinary Arts, Certificate • Marketing, A.A.S. <ul style="list-style-type: none"> ○ Marketing, A.A.S./Digital Marketing Specialization[†] (formerly e-Commerce Specialization) ○ Marketing, A.A.S./International Marketing Specialization[†] ○ Marketing, A.A.S./Public Relations Specialization[†] ○ Social Media, Career Studies Certificate (formerly e-Commerce) ○ Marketing, Career Studies Certificate ○ Promotion & Public Relations, Career Studies Certificate ○ Retail Management, Career Studies Certificate
<p>3. Health Sciences Programs</p> <ul style="list-style-type: none"> • Dental Hygiene, A.A.S. • Dental Assisting, Certificate • Diagnostic Medical Sonography, A.A.S. • Emergency Medical Services, A.A.S. <ul style="list-style-type: none"> ○ Emergency Medical Technician – Basic, Career Studies Certificate ○ Emergency Medical Technician – Intermediate, Career Studies Certificate

NOVA Programs by Guided Pathway

- Paramedic, Career Studies Certificate
- Fire Science Technology, A.A.S.
- Fitness, Career Studies Certificate
- Health Information Management, A.A.S.
 - Clinical Data Coding, Career Studies Certificate
 - Health Information Technology, Career Studies Certificate
- Health Science, Career Studies Certificate
- Massage Therapy, Career Studies Certificate
- Medical Laboratory Technology, A.A.S.
 - Phlebotomy, Career Studies Certificate
- Medical Transcription, Career Studies Certificate†
- Nursing, A.A.S.
- Occupational Therapy Assistant, A.A.S.
- Physical Therapist Assistant, A.A.S.
- Radiation Oncology, A.A.S. (Distance Learning program offered through VA Western CC)
- Radiography, A.A.S.
- Respiratory Therapy, A.A.S.

4. Information Technology, Computer Science, and Mathematics Programs

Information Technology and Computer Science Programs

- Computer Science, A.S.
- Cybersecurity, A.A.S.
- Cybersecurity, Career Studies Certificate (formerly Network Security)
 - Network Administration, Career Studies Certificate
 - Network Engineering (Specialist), Career Studies Certificate
- Information Systems Technology, A.A.S.
 - Application Programming, Career Studies Certificate
 - Database Specialist, Career Studies Certificate
 - IT Technical Support, Career Studies Certificate
- Information Technology, A.S.
- Web Design and Development, Career Studies Certificate
 - Web Design Specialist, Career Studies Certificate

Mathematics Programs

- Science, A.S./Mathematics Specialization

5. Liberal Arts and Social Science Programs

Liberal Arts Programs

- Liberal Arts A.A.
 - Liberal Arts, A.A./Art History Specialization
 - Liberal Arts, A.A./International Studies Specialization
 - Liberal Arts, A.A./Psychology Specialization
 - Liberal Arts, A.A./Communication Studies
 - Liberal Arts, A.A./English Specialization
 - African-American Studies, Career Studies Certificate†
 - Chinese Studies, Career Studies Certificate†
 - Japanese Studies, Career Studies Certificate†

NOVA Programs by Guided Pathway

- Latin American, Studies Career Studies Certificate†
- Professional Writing, Certificate
- American Sign Language to English Interpretation, A.A.S.
 - American Sign Language, Career Studies Certificate
- General Education, Certificate
- General Studies, A.S.
 - General Studies, A.S./Recreation, Parks & Leisure Studies Specialization
- Outdoor Recreation and Resource Management, Career Studies Certificate
 - Recreation Programming and Administration, Career Studies Certificate

Social Science Programs

- Social Sciences, A.S.
 - Social Sciences, A.S./Deaf Studies Specialization
 - Social Sciences, A.S./Political Science Specialization
 - Social Sciences, A.S./Psychology Specialization
 - Social Sciences, A.S./Geospatial Specialization
- Public History and Historic Preservation, Career Studies Certificate (formerly Historic Preservation)

6. Physical Science, Engineering, and Applied Technologies Programs

Applied Technology Programs

- Architecture Technology, A.A.S.
- Architectural Drafting, Certificate
- Air Conditioning and Refrigeration, A.A.S.
 - Air Conditioning and Refrigeration, Certificate
 - HVAC-R and Facilities Services Technology, Career Studies Certificate
- Automotive Technology, A.A.S.
 - Automotive Technology, A.A.S./Emissions Specialization
 - Automotive Maintenance and Light Repair, Career Studies Certificate
 - Collision Repair Technology, Career Studies Certificate
- Diesel Mechanics Technology, Career Studies Certificate
- Construction Management Technology, A.A.S.
 - Construction Supervision, Career Studies Certificate
- Engineering Technology, A.A.S.
 - Engineering Technology, A.A.S./Civil Engineering Technology Specialization
 - Engineering Technology, A.A.S./Drafting Specialization
 - Engineering Technology, A.A.S./Mechanical Engineering Technology Specialization
- Computer Aided Drafting and Design, Career Studies Certificate
- Electronic Media in Design Rendering and Animation, Career Studies Certificate†
- Site Development, Career Studies Certificate (formerly Land Planning, Survey, and Development)
- Geographic Information Systems, Career Studies Certificate
- Welding/Basic Techniques, Career Studies Certificate

Physical Science and Engineering Programs

- Engineering, A.S.

NOVA Programs by Guided Pathway

- Engineering, A.S./Electrical Engineering Specialization
- Science, A.S.

7. Public Service, Social Service, and Education Programs

Public and Social Service Programs

- Administration of Justice, A.A.S.
 - Administration of Justice, A.A.S./Homeland Security Specialization
 - Administration of Justice, Certificate
 - Security Management, Career Studies Certificate
 - National Security Career, Studies Certificate
- General Forensic Investigation, Career Studies Certificate
 - Advanced Forensic Investigation, Career Studies Certificate
- Paralegal Studies, A.A.S.
- Substance Abuse Rehabilitation Counselor, Certificate

Education Programs

- Early Childhood Development, A.A.S.
 - Early Childhood Development, A.A.S./School-Age Child Specialization[†]
 - Early Childhood Development, Certificate
 - Infant and Toddler Care, Career Studies Certificate
 - Early Childhood Development, Career Studies Certificate
- Paraprofessional Teacher Assistant, Career Studies Certificate[†]
- Social Sciences, A.S./Teacher Education Specialization
 - Driver Education, Career Studies Certificate

8. Visual and Performing Arts, Digital Media, and Design Programs

- Communication Design, A.A.S.
 - Communication Design, A.A.S./Interactive Design Specialization
 - Multimedia Design, Certificate
- Web Design Specialist, Career Studies Certificate
- Fine Arts, A.A.
- Fine Arts, A.A.A.
 - Fine Arts, A.A.A./Photography Specialization
- Interior Design, A.A.S.
- Music, A.A.
- Music, A.A.A.
 - Music, A.A.A./Jazz/Popular Music Specialization
 - Theatre, Career Studies Certificate
- Music Recording Technology, Certificate
- Photography and Media, A.A.S.

NOVA Mission and Strategic Goals

Mission

With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.

Strategic Goals

- I. **STUDENT SUCCESS** – Northern Virginia Community College will move into the top tier of community colleges with respect to the college readiness, developmental course completion, retention, graduation, transfer, and career placement of its students.
- II. **ACCESS** – Northern Virginia Community College will increase the number and diversity of students being served to mirror the population growth of the region.
- III. **TEACHING AND LEARNING** – Northern Virginia Community College will focus on student success by creating an environment of world-class teaching and learning.
- IV. **EXCELLENCE** – Northern Virginia Community College will develop ten focal points of excellence in its educational programs and services that will be benchmarked to the best in the nation and strategic to building the College's overall reputation for quality.
- V. **LEADERSHIP** – Northern Virginia Community College will serve as a catalyst and a leader in developing educational and economic opportunities for all Northern Virginians and in maintaining the quality of life and economic competitiveness of the region.
- VI. **PARTNERSHIPS** – Northern Virginia Community College will develop strategic partnerships to create gateways of opportunity and an integrated educational system for Northern Virginians who are pursuing the American Dream.
- VII. **RESOURCES** – Northern Virginia Community College will increase its annual funding by \$100 million and expand its physical facilities by more than one million square feet in new and renovated space. This includes the establishment of two additional campuses at epicenters of the region's population growth, as well as additional education and training facilities in or near established population centers.
- VIII. **EMERGENCY PREPAREDNESS AND CONTINUITY OF OPERATIONS** – Northern Virginia Community College will be recognized as a leader among institutions of higher education in Virginia for its development and testing of emergency response and continuity of operation plans.

NOVA

**Northern Virginia
Community College**

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