



**Division of Research
and Statistics**

STEM Occupations in New York State

June 2016

A Division of the New York State Department of Labor

STEM Occupations in New York State

Introduction

“STEM” is used to refer to occupations that involve studies in these four fields:

- **S**cience
- **T**echnology
- **E**ngineering
- **M**athematics

STEM jobs are a catalyst for regional economic growth as they bolster innovation while improving productivity across the workforce. Although very competitive, STEM careers offer many advantages, including:

- Relatively high wages
- Low unemployment rates
- Growing employment opportunities

In addition, STEM careers tend to be more financially lucrative than non-STEM careers. In New York State, the 2015 median hourly wage for job titles classified as “STEM Core” jobs was \$38.96, which is about 58% higher than the comparable wage (\$24.65) for non-STEM job titles. STEM careers typically require a bachelor’s degree or higher, but there also exist certain STEM occupations in which an associate degree and/or a post-secondary vocational certificate are the only pre-requisites needed for entry.

All statewide and regional STEM data presented in this report come from Economic Modeling Specialists International (EMSI), an economic software firm that specializes in employment data and labor market analysis.

Defining STEM

The acronym “STEM” is widely used in discussions across government, academia, and business, given the recent increased emphasis on innovation and its implications for the economy and labor market. The discussion and analyses quickly get confounded, however, since there is no commonly agreed upon definition of STEM.

In July 2011, the U.S. Office of Management and Budget (OMB) asked the Standard Occupation Classification Policy Committee (SOCPC) to recommend options for defining STEM occupations based on the 2010 Standard Occupational Classification system. This request was made in order to enhance comparability of data across statistical agencies and organizations studying the STEM workforce for policymaking purposes, including educational and workforce planners. This definition, unlike previous

attempts, also includes higher-level health care occupations. The number of jobs in these health-related occupations is almost twice the number of non-health or core STEM occupations.

Including health related STEM job titles in this report would heavily skew much of the analysis. For example, females constitute just over 1 in 4 workers in core STEM occupations (indicative of a need to recruit more women to the field), but more than half of workers in all STEM occupations. Similarly, the health care and core STEM occupations face many different challenges, so this report will focus on “core STEM” job titles only. See Appendix A at the end of this report for a list of STEM job titles, based on the SOCP’s recommendations.

Regional Trends in STEM Employment

In New York State, between 2010 and 2015, employment in STEM jobs grew by 7.4%, or 26,075, to 379,212, while the nation grew by 8.9% over the same period. Looking across the 10 regions of the state, job growth was concentrated in certain labor market regions. From 2010 to 2015, growth in STEM employment was strongest in these regions:

- New York City (+15.0%)
- Capital Region (+9.9%)
- Finger Lakes (+7.1%)
- Long Island (+1.7%)
- Western New York (+1.5%)

Meanwhile, these labor market regions experienced declines in their STEM employment levels over the 2010 to 2015 period:

- Mohawk Valley (-10.7%)
- North Country (-9.7%)
- Southern Tier (-7.1%)
- Hudson Valley (-4.4%)
- Central New York (-0.8%)

Industries with the Most STEM Employment

The top five industries in STEM had a combined employment base of 140,562 in 2015. Together, these five largest industries accounted for almost 40% of overall STEM employment in New York State. The five statewide industries with the largest number of STEM jobs include:

- Architectural, engineering and related services (46,548)
- Computer system design and related services (37,409)
- Scientific research and development services (27,048)
- Management of companies and enterprises (14,924)

- Local government, excluding education and hospitals (14,633)

Occupations with the Most STEM Employment

The 15 largest STEM occupations are primarily focused in computer science-related titles. Combined, this group of occupational titles created 21,130 jobs, accounting for more than three out of every four jobs added in STEM.

Within the computer science-related occupational group, computer user support specialists, with an employment base of 41,841 are the single largest STEM occupation. Computer User Support Specialists also have the most annual openings (+1,576) of any STEM occupation in the state. Women are very much underrepresented in this occupation, accounting for just 27% of those employed.

Computer-related job titles have a wide salary range. At the low end, computer user support specialists have a median hourly wage of \$25.40, while at the high end computer and information systems managers have a median hourly wage of \$70.27. Outside of computer user support specialists, which only require a vocational certificate and some college experience for job entry, most of the rest of the occupations in that top 15 group require a bachelor's degree or higher.

Most STEM occupations have more men than women, with an overall male/female ratio of about three to one. The top 15 STEM occupation with the largest concentration of female employees are in the life, physical and social science fields.

Looking at individual occupational titles, clinical, counseling and school psychologist has the largest percentage (67%) of employees that are women. This group also has the most annual openings (600).

The detailed tables that follow this section provide greater insight into New York State's STEM workforce. Data are presented for a number of important areas including:

- Regional trends in STEM employment
- Breakdown of STEM workforce by gender, age and race/ethnicity
- 15 industries with the most STEM workers
- 15 largest STEM occupations
- 15 STEM occupations with the most net job growth, 2010-2015
- 15 highest earning STEM occupations
- 15 STEM occupations with the largest percent share of female workers

Summary

STEM job titles represent the future of the economy and where many of the jobs of tomorrow will be. This report offers a rich set of labor market statistics that are specific to New York State and its 10 labor market regions. We hope this information will be useful to students, job seekers and others interested in the current and future outlook for STEM jobs.

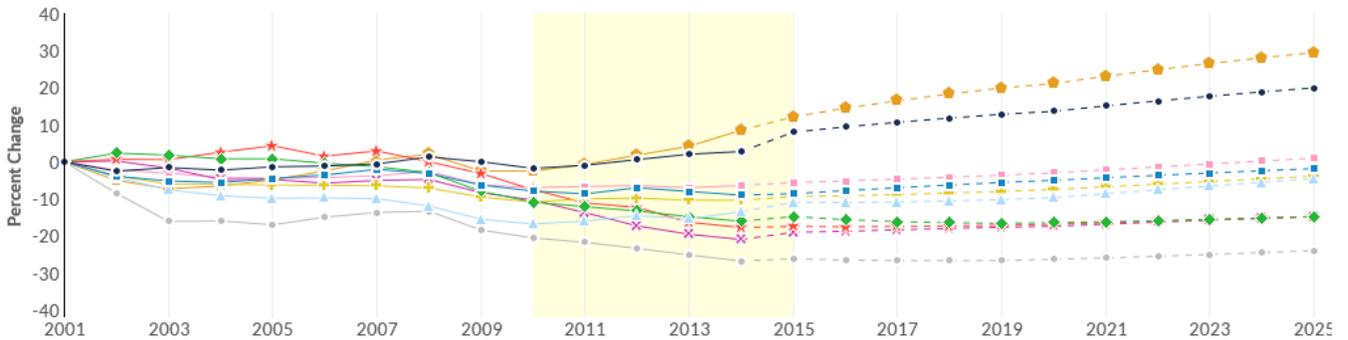
For Further Information

Questions regarding this report should be directed to Kevin Jack, Statewide Labor Market Analyst. He can be reached via email at Kevin.Jack@labor.ny.gov or by phone at (518) 457-3800.

Table 1: Occupational Summary for Core STEM Occupations, New York State (SOC Policy Committee)

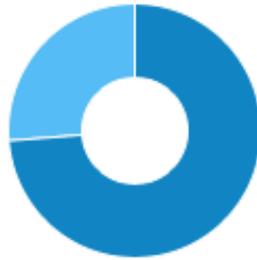
<p>379,212 Jobs (2015)</p>	<p>+7.4% % Change (2010-2015) Nation: +8.9%</p>	<p>\$38.96/hr Median Hourly Earnings Nation: \$37.93/hr</p>
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Table 2: Regional Trends in STEM Jobs, New York State, 2010-2015



	Region	2010 Jobs	2015 Jobs	Change	% Change
●	Capital Region	26,420	29,047	2,627	9.9%
●	Central New York	15,961	15,839	-122	-0.8%
●	Finger Lakes	27,794	29,760	1,966	7.1%
●	Hudson Valley	37,254	35,624	-1,630	-4.4%
●	Long Island	46,458	47,243	785	1.7%
●	Mohawk Valley	5,634	5,030	-604	-10.7%
●	New York City	139,804	160,780	20,976	15.0%
●	North Country	3,861	3,487	-374	-9.7%
●	Southern Tier	15,227	14,147	-1,080	-7.1%
●	Western New York	25,205	25,580	375	1.5%

Table 3: Core STEM Occupations, Gender Breakdown, New York State, 2015



	Gender	2015 Jobs	2015 Percent
•	Males	279,674	73.8%
•	Females	99,539	26.2%

Table 4: Core STEM Occupations, Age Breakdown, New York State, 2015



	Age	2015 Jobs	2015 Percent
•	14-18	1,133	0.3%
•	19-24	22,830	6.0%
•	25-34	93,431	24.6%
•	35-44	94,855	25.0%
•	45-54	91,737	24.2%
•	55-64	59,901	15.8%
•	65+	15,325	4.0%

Table 5: Core STEM Occupations, Race/Ethnicity Breakdown, New York State, 2015



	Race/Ethnicity	2015 Jobs	2015 Percent	
●	White	274,615	72.4%	<div style="width: 72.4%;"></div>
●	Asian	49,993	13.2%	<div style="width: 13.2%;"></div>
●	Hispanic or Latino	25,578	6.7%	<div style="width: 6.7%;"></div>
●	Black or African American	25,159	6.6%	<div style="width: 6.6%;"></div>
●	Two or More Races	3,029	0.8%	<div style="width: 0.8%;"></div>
●	American Indian or Alaska Native	516	0.1%	<div style="width: 0.1%;"></div>
●	Native Hawaiian or Other Pacific Islander	322	0.1%	<div style="width: 0.1%;"></div>

**Table 6: Top 15 Industries Employing STEM Occupations,
New York State, 2015**

NAICS	Industry	STEM Jobs in Industry (2015)	Net Change, 2010 - 2015	Percent of STEM Jobs in Industry (2015)	Percent of Total Jobs in Industry (2015)
5413	Architectural, Engineering, and Related Services	46,548	5,597	12.3%	61.5%
5415	Computer Systems Design and Related Services	37,409	9,090	9.9%	32.0%
5417	Scientific Research and Development Services	27,048	2,396	7.1%	49.2%
5511	Management of Companies and Enterprises	14,924	1,207	3.9%	10.4%
9039	Local Government, Excluding Education and Hospitals	14,633	(566)	3.9%	3.2%
6113	Colleges, Universities, and Professional Schools	13,865	545	3.7%	5.6%
5416	Management, Scientific, and Technical Consulting Services	11,204	2,235	3.0%	12.7%
9029	State Government, Excluding Education and Hospitals	10,714	(1,096)	2.8%	7.1%
9036	Education and Hospitals (Local Government)	9,583	(569)	2.5%	1.6%
9011	Federal Government, Civilian	9,573	(1,636)	2.5%	8.1%
6213	Offices of Other Health Practitioners	6,865	17	1.8%	11.1%
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	6,729	86	1.8%	30.1%
3344	Semiconductor and Other Electronic Component Manufacturing	6,558	5	1.7%	33.0%
5613	Employment Services	6,432	1,289	1.7%	4.0%
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	6,411	152	1.7%	16.9%

**Table 7: Top 15 Largest STEM Occupations,
New York State, 2015**

SOC Code	Occupation	2015 Jobs	Net Change, 2010- 2015	2015 Location Quotient	Annual Openings	Median Hourly Earnings	Percent Females
15-1151	Computer User Support Specialists	41,841	4,531	1.01	1,576	\$25.40	27%
11-3021	Computer and Information Systems Managers	25,861	3,183	1.15	996	\$70.27	27%
15-1142	Network and Computer Systems Administrators	24,062	2,001	0.99	786	\$40.42	19%
15-1133	Software Developers, Systems Software	18,043	2,177	0.69	657	\$50.22	19%
19-3031	Clinical, Counseling, and School Psychologists	16,425	261	1.65	600	\$37.53	67%
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	15,125	559	0.65	462	\$38.47	26%
17-2051	Civil Engineers	14,640	1,030	0.81	593	\$41.79	12%
17-1011	Architects, Except Landscape and Naval	12,564	2,188	1.69	796	\$37.46	26%
15-1134	Web Developers	11,547	2,189	1.10	613	\$31.90	29%
17-2071	Electrical Engineers	11,336	619	0.98	369	\$45.22	7%
17-2141	Mechanical Engineers	10,667	510	0.60	463	\$39.43	6%
15-1152	Computer Network Support Specialists	10,154	479	0.82	268	\$35.03	27%
17-2112	Industrial Engineers	8,722	259	0.56	325	\$39.57	17%
19-1042	Medical Scientists, Except Epidemiologists	8,296	583	1.24	295	\$36.76	49%
15-1143	Computer Network Architects	7,245	561	0.77	244	\$52.70	20%

**Table 8: Top 15 Growth STEM Occupations, based on
Net Change, New York State, 2010-2015**

SOC Code	Occupation	2015 Jobs	Net Change, 2010-2015	Location Quotient	Annual Openings	Median Hourly Earnings	Percent Females
15-1151	Computer User Support Specialists	41,841	4,531	1.01	1,576	\$25.40	27%
11-3021	Computer and Information Systems Managers	25,861	3,183	1.15	996	\$70.27	27%
15-1134	Web Developers	11,547	2,189	1.10	613	\$31.90	29%
17-1011	Architects, Except Landscape and Naval	12,564	2,188	1.69	796	\$37.46	26%
15-1133	Software Developers, Systems Software	18,043	2,177	0.69	657	\$50.22	19%
15-1142	Network and Computer Systems Administrators	24,062	2,001	0.99	786	\$40.42	19%
17-2051	Civil Engineers	14,640	1,030	0.81	593	\$41.79	12%
15-2031	Operations Research Analysts	5,609	785	0.93	279	\$42.93	39%
17-2071	Electrical Engineers	11,336	619	0.98	369	\$45.22	7%
19-1042	Medical Scientists, Except Epidemiologists	8,296	583	1.24	295	\$36.76	49%
19-4061	Social Science Research Assistants	6,964	579	3.61	378	\$17.77	48%
15-1143	Computer Network Architects	7,245	561	0.77	244	\$52.70	20%
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	15,125	559	0.65	462	\$38.47	26%
17-2141	Mechanical Engineers	10,667	510	0.60	463	\$39.43	6%
15-1152	Computer Network Support Specialists	10,154	479	0.82	268	\$35.03	27%

**Table 9: Top 15 Highest Earning STEM Occupations,
New York State, 2015**

SOC Code	Occupation	2015 Jobs	Net Change, 2010-2015	Location Quotient	Annual Openings	Median Hourly Earnings	Percent Females
11-3021	Computer and Information Systems Managers	25,861	3,183	1.15	996	\$70.27	27%
11-9041	Architectural and Engineering Managers	6,944	214	0.59	219	\$66.17	8%
17-2171	Petroleum Engineers	253	(10)	0.12	10	\$64.72	8%
11-9121	Natural Sciences Managers	2,023	7	0.58	58	\$61.58	38%
15-2011	Actuaries	2,604	328	1.76	136	\$58.73	29%
19-3094	Political Scientists	175	9	0.37	6	\$56.88	50%
19-3011	Economists	746	7	0.57	29	\$53.82	33%
19-2012	Physicists	1,137	48	1.02	37	\$52.81	14%
15-1143	Computer Network Architects	7,245	561	0.77	244	\$52.70	20%
17-2011	Aerospace Engineers	766	(105)	0.17	30	\$51.32	11%
19-2011	Astronomers	67	(2)	0.55	2	\$51.27	Insf. Data
15-2021	Mathematicians	64	7	0.27	4	\$51.16	44%
17-2161	Nuclear Engineers	845	22	0.71	32	\$50.59	9%
15-1133	Software Developers, Systems Software	18,043	2,177	0.69	657	\$50.22	19%
17-2061	Computer Hardware Engineers	1,631	(266)	0.32	70	\$47.72	14%

Table 10: Top 15 STEM Occupations with the Highest Share of Female Workers, New York State, 2015

SOC Code	Occupation	2015 Jobs	Net Change 2010-2015	Location Quotient	Annual Openings	Median Hourly Earnings	Percent Females
19-3031	Clinical, Counseling, and School Psychologists	16,425	261	1.65	600	\$37.53	67%
19-3039	Psychologists, All Other	1,260	(69)	1.07	47	\$43.35	66%
19-3032	Industrial-Organizational Psychologists	175	(4)	1.73	9	\$37.23	65%
19-3022	Survey Researchers	790	(29)	0.73	25	\$31.99	53%
19-3041	Sociologists	471	67	2.80	27	\$35.21	52%
19-1021	Biochemists and Biophysicists	2,288	195	1.09	110	\$30.56	52%
19-3099	Social Scientists and Related Workers, All Other	2,449	59	1.08	78	\$39.99	51%
19-3094	Political Scientists	175	9	0.37	6	\$56.88	50%
19-3091	Anthropologists and Archeologists	285	10	0.55	11	\$32.37	50%
19-1022	Microbiologists	1,721	41	1.24	64	\$31.81	49%
19-1042	Medical Scientists, Except Epidemiologists	8,296	583	1.24	295	\$36.76	49%
19-1041	Epidemiologists	228	(5)	0.63	6	\$32.13	49%
19-1029	Biological Scientists, All Other	755	(80)	0.35	27	\$35.52	49%
19-4061	Social Science Research Assistants	6,964	579	3.61	378	\$17.77	48%
19-4021	Biological Technicians	3,515	94	0.74	139	\$19.50	48%

Appendix A: STEM Occupational Titles (SOC Policy Committee)

SOC Code	Occupation
11-3021	Computer and Information Systems Managers
11-9041	Architectural and Engineering Managers
11-9121	Natural Sciences Managers
15-1133	Software Developers, Systems Software
15-1134	Web Developers
15-1141	Database Administrators
15-1142	Network and Computer Systems Administrators
15-1143	Computer Network Architects
15-1151	Computer User Support Specialists
15-1152	Computer Network Support Specialists
15-1199	Computer Occupations, All Other
15-2011	Actuaries
15-2021	Mathematicians
15-2031	Operations Research Analysts
15-2041	Statisticians
15-2091	Mathematical Technicians
15-2099	Mathematical Science Occupations, All Other
17-1011	Architects, Except Landscape and Naval
17-1012	Landscape Architects
17-1021	Cartographers and Photogrammetrists
17-1022	Surveyors
17-2011	Aerospace Engineers
17-2021	Agricultural Engineers
17-2031	Biomedical Engineers
17-2041	Chemical Engineers

SOC Code	Occupation
17-2051	Civil Engineers
17-2061	Computer Hardware Engineers
17-2071	Electrical Engineers
17-2072	Electronics Engineers, Except Computer
17-2081	Environmental Engineers
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
17-2112	Industrial Engineers
17-2121	Marine Engineers and Naval Architects
17-2131	Materials Engineers
17-2141	Mechanical Engineers
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers
17-2161	Nuclear Engineers
17-2171	Petroleum Engineers
17-2199	Engineers, All Other
17-3011	Architectural and Civil Drafters
17-3012	Electrical and Electronics Drafters
17-3013	Mechanical Drafters
17-3019	Drafters, All Other
17-3021	Aerospace Engineering and Operations Technicians
17-3022	Civil Engineering Technicians
17-3023	Electrical and Electronics Engineering Technicians
17-3024	Electro-Mechanical Technicians
17-3025	Environmental Engineering Technicians
17-3026	Industrial Engineering Technicians
17-3027	Mechanical Engineering Technicians
17-3029	Engineering Technicians, Except Drafters, All Other
17-3031	Surveying and Mapping Technicians

SOC Code	Occupation
19-1011	Animal Scientists
19-1012	Food Scientists and Technologists
19-1013	Soil and Plant Scientists
19-1021	Biochemists and Biophysicists
19-1022	Microbiologists
19-1023	Zoologists and Wildlife Biologists
19-1029	Biological Scientists, All Other
19-1031	Conservation Scientists
19-1032	Foresters
19-1041	Epidemiologists
19-1042	Medical Scientists, Except Epidemiologists
19-1099	Life Scientists, All Other
19-2011	Astronomers
19-2012	Physicists
19-2021	Atmospheric and Space Scientists
19-2031	Chemists
19-2032	Materials Scientists
19-2041	Environmental Scientists and Specialists, Including Health
19-2042	Geoscientists, Except Hydrologists and Geographers
19-2043	Hydrologists
19-2099	Physical Scientists, All Other
19-3011	Economists
19-3022	Survey Researchers
19-3031	Clinical, Counseling, and School Psychologists
19-3032	Industrial-Organizational Psychologists
19-3039	Psychologists, All Other
19-3041	Sociologists

SOC Code	Occupation
19-3051	Urban and Regional Planners
19-3091	Anthropologists and Archeologists
19-3092	Geographers
19-3094	Political Scientists
19-3099	Social Scientists and Related Workers, All Other
19-4011	Agricultural and Food Science Technicians
19-4021	Biological Technicians
19-4031	Chemical Technicians
19-4041	Geological and Petroleum Technicians
19-4051	Nuclear Technicians
19-4061	Social Science Research Assistants
19-4091	Environmental Science and Protection Technicians, Including Health
19-4092	Forensic Science Technicians
19-4093	Forest and Conservation Technicians
19-4099	Life, Physical, and Social Science Technicians, All Other
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
41-9031	Sales Engineers

Appendix B: Data Sources and Calculations

Location Quotient

Location quotient (LQ) is a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region unique in comparison to the national average.

Occupation Data

EMSI occupation employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry.

Industry Data

EMSI industry data have various sources depending on the class of worker. (1) For QCEW Employees, EMSI primarily uses the QCEW (Quarterly Census of Employment and Wages), with supplemental estimates from County Business Patterns and Current Employment Statistics. (2) Non-QCEW employees data are based on a number of sources including QCEW, Current Employment Statistics, County Business Patterns, BEA State and Local Personal Income reports, the National Industry-Occupation Employment Matrix (NIOEM), the American Community Survey, and Railroad Retirement Board statistics. (3) Self-Employed and Extended Proprietor classes of worker data are primarily based on the American Community Survey, Nonemployer Statistics, and BEA State and Local Personal Income Reports. Projections for QCEW and Non-QCEW Employees are informed by NIOEM and long-term industry projections published by individual states.

Staffing Patterns Data

The staffing pattern data in this report are compiled from several sources using a specialized process. For QCEW and Non-QCEW Employees classes of worker, sources include Occupational Employment Statistics, the National Industry-Occupation Employment Matrix, and the American Community Survey. For the Self-Employed and Extended Proprietors classes of worker, the primary source is the American Community Survey, with a small amount of information from Occupational Employment Statistics.

State Data Sources

This report uses state data from the following agencies: New York Department of Labor, Division of Research and Statistics.

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