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# THINGS TO KNOW ABOUT **STEM** INDUSTRIES AND **CAREERS** IN **MASSACHUSETTS**

**MASS  
STEM  
WEEK**  
OCT 22-26, 2018

**“STEM” is the acronym for science,  
technology, engineering and mathematics.**

As Massachusetts celebrates its first annual statewide STEM Week, it's an opportune time to take stock of what STEM means to the Commonwealth's economy and future. Here are seven things to know about STEM industries and careers in Massachusetts—one for each day of STEM Week.



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# 1

## STEM Jobs and Industries are Vital to the Massachusetts Economy

According to employment estimates conducted through the Occupational Employment Statistics (OES) program, about 600,000 people work in STEM occupations in Massachusetts. STEM workers represent 17% of the total workforce in Massachusetts—about one-third higher than the U.S. average of 13%. Adjusted for population size, Massachusetts has more demand for STEM jobs than almost every other state.

**600,000**

people work in STEM occupations in Massachusetts

**17%**

of the total workforce in Massachusetts

Jobs	Massachusetts (# and %)	United States (# and %)
STEM	595,780 17%	18,385,250 13%
Non-STEM	2,932,300 83%	124,164,000 87%
<b>Totals:</b>	<b>3,528,080</b>	<b>142,549,250</b>

**Source:** Commonwealth Corporation analysis of Massachusetts Department of Unemployment Assistance, Economic Research Department, accessed at [http://lmi2.detma.org/lmi/lmi\\_oes\\_a.asp](http://lmi2.detma.org/lmi/lmi_oes_a.asp), and U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics (OES) 2017, accessed at <https://www.bls.gov/oes/home.htm>.

### States with the Highest Demand for STEM Occupations, Adjusted for Population

State	Job Postings	Job Postings per 10,000 employed	Level of STEM Job Demand
Alaska	27,494	821	Higher demand than average
Colorado	203,916	821	Higher demand than average
Massachusetts	272,165	799	Higher demand than average
Virginia	291,818	786	Higher demand than average
Delaware	33,049	766	Higher demand than average
Arizona	192,170	744	Higher demand than average
Connecticut	122,086	737	Higher demand than average
Maryland	182,504	708	Higher demand than average
Washington	217,002	695	Average demand

**Source:** Labor Insight Jobs, Burning Glass Technologies: Report on Job Postings (09/01/2017 - 08/31/2018).





## 2

## STEM Jobs are Everywhere—including Some Places You Might Not Think

As you might expect, STEM occupations cover a wide range of positions in healthcare, computer and information technology, engineering, and the sciences. In Massachusetts, 43% of jobs in the professional and technical sectors are STEM jobs and 36% of healthcare jobs are STEM jobs, as are 36% of information industry jobs. In point of fact, STEM jobs are an important part of almost every industry in Massachusetts.

For example:

- As technology continues to reshape the manufacturing sector, more than 20% of manufacturing jobs in Massachusetts have become STEM jobs.
- One out of every seven post-secondary teaching jobs in Massachusetts is a STEM job.
- In public administration, one out of every seven jobs is a STEM job.
- Business services, financial activities and the wholesale/retail sectors employ more than 70,000 workers in STEM occupations.

In Massachusetts

### 43%

of jobs in the professional and technical sectors are STEM jobs

### 36%

of healthcare and information industry jobs are STEM jobs

### STEM Occupations by Industry Sector in Massachusetts

Industry Sector	STEM Employment	Total Sector Employment	STEM Jobs as % of Sector
Health Care and Social Assistance	225,950	630,570	36%
Professional and Technical Services	131,450	308,710	43%
Manufacturing	51,120	243,660	21%
Educational Services	48,330	369,850	13%
Trade, Wholesale and Retail	32,860	481,020	7%
Information	31,760	91,730	35%
Public Administration	25,610	193,550	13%
Business and Administrative Services	21,940	252,110	9%
Finance, Insurance, Real Estate, Leasing	16,910	214,000	8%
Construction	2,930	151,650	2%
Leisure, Hospitality, Other Services	2,570	473,030	1%
Transportation, Utilities, Natural Resources	1,810	117,540	2%
<b>Total, All Industries:</b>	<b>595,780</b>	<b>3,528,070</b>	<b>17%</b>

**Source:** Commonwealth Corporation analysis of Massachusetts Department of Unemployment Assistance, Economic Research Department, Occupational Employment Statistics, Industry Staffing Pattern, accessed at [http://lmi2.detma.org/lmi/lmi\\_oes\\_a\\_all\\_ind\\_Occ2.asp](http://lmi2.detma.org/lmi/lmi_oes_a_all_ind_Occ2.asp).





# 3

## STEM Jobs in Massachusetts are Good-Paying Jobs

Not only are STEM jobs plentiful in the Commonwealth—they're largely very good jobs as well. In Massachusetts, workers in STEM careers have an average annual wage of almost \$98,500, compared to an average annual wage of about \$62,000 for Massachusetts workers as a whole. Entry-level wages for STEM workers in Massachusetts are strong, too—about \$54,000 on average, compared to \$27,190 for Massachusetts workers as a whole. That works out to an hourly wage of \$26.13, compared to just \$13.07 for non-STEM entry-level workers.

In Massachusetts

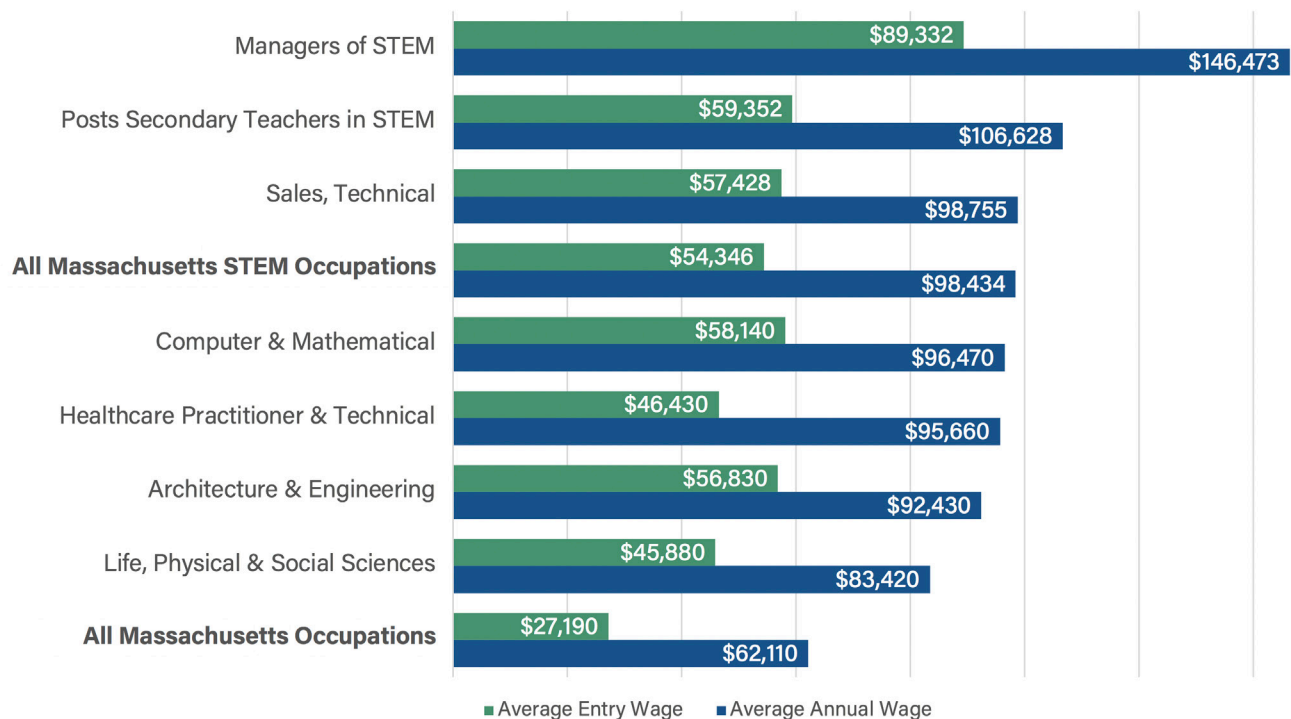
**\$98,500**

average annual wage in STEM careers

**\$54,000**

average entry-level wage in STEM careers

### Average Entry and Annual Wages for STEM Occupations



Source: Commonwealth Corporation analysis of Massachusetts Department of Unemployment Assistance, Economic Research Department, Occupational Employment Statistics data, 2017.







# 4

## You Don't Always Need a High Level of Education to Get a Good-Paying Stem Job

What's more, good STEM jobs in Massachusetts are available to people who don't have a high level of education. To be sure, 57% of entry-level STEM jobs in Massachusetts typically require at least a bachelor's degree, and 20% require a master's degree or higher. However, 20% of entry-level STEM jobs don't require more than an associate's degree, or simply a post-secondary credential—the kind that can be earned in a short-term education or training program.

These jobs are also good jobs: on average, their entry-level and median wages are significantly above those for Massachusetts jobs in general. Indeed, even the small number of STEM jobs in Massachusetts that require no more than a high school diploma have an average starting wage that is higher than the entry-level wage for all Massachusetts jobs.

**57%**  
of entry-level STEM jobs in Massachusetts typically require at least a bachelor's degree

**20%**  
require a master's degree or higher

**20%**  
of entry-level STEM jobs don't require more than an associate's degree or certificate

### STEM Occupations by Typical Education Level Needed for Entry

Education Level	# Jobs	% of STEM Total	Average Wage	Entry Wage
Doctoral or professional degree	90,480	15%	\$139,197	\$73,255
Master's degree	29,290	5%	\$100,733	\$69,139
Bachelor's degree	341,060	57%	\$102,219	\$66,735
Associate's degree	63,910	11%	\$66,794	\$46,125
Post-secondary Certificate	55,100	9%	\$55,428	\$38,965
High School Diploma	13,360	2%	\$43,423	\$30,119
<b>Total STEM Jobs</b>	<b>595,780</b>	<b>100%</b>	<b>\$98,434</b>	<b>\$54,346</b>
<b>Total ALL Massachusetts Jobs</b>	<b>3,528,070</b>	<b>***</b>	<b>\$62,110</b>	<b>\$27,190</b>

Source: Commonwealth Corporation analysis of Massachusetts Department of Unemployment Assistance, Economic Research Department, Occupational Employment Statistics data, 2017.





# 5

## Massachusetts is Investing Strongly in STEM Industries Today

Public investment in STEM takes place in many areas: in our education system, through economic development initiatives, and through the workforce development system. While many states have episodic or small-scale initiatives, Massachusetts is one of just a handful of states that has long standing, statewide programs that help businesses meet their training needs, give un- and underemployed people pathways to employment, and help young people develop the hard and soft skills they need to become employed. These programs—the Workforce Training Fund, the Workforce Competitiveness Trust Fund, and YouthWorks—are key components of Massachusetts’ STEM investment strategy.

The Workforce Training Fund, for example, provides grants to Massachusetts businesses to upgrade the skills of their workers and support their competitiveness. To date, the Baker-Polito Administration has provided more than 380 grants totalling \$37 million to companies in four industry sectors that have large shares of workers (more than 20%) employed in STEM occupations. These grants have supported training for more than 25,000 workers.

Similarly, Massachusetts is building stronger pipelines to increase the number of high school students, community college students, and out-of-school youth entering high-quality careers, including STEM careers. For example, YouthWorks, the state’s subsidized youth employment program, supports skills training that helps young people earn credentials in STEM fields such as health care, technology, and IT-related banking jobs. The Massachusetts Clean Energy Center and Commonwealth Corporation, the state’s workforce development authority, operate Learn and Earn, which has funded 25 partnerships between high schools, colleges, and employers to get high school students interested in—and excited about—STEM careers in clean energy.

**380 grants**  
provided by the Baker-Polito Administration

**totalling \$37M**  
to companies in four industry sectors that have large shares of workers in the STEM occupations

### Massachusetts Workforce Training Fund Investments by STEM Sector, 2015-Present

Industry Sector	Workforce Training Fund Investment	Planned # of Trainees
Manufacturing	\$27,558,403	18,203
Professional, Scientific and Technical Services	\$5,512,198	3,503
Healthcare & Social Assistance	\$3,425,433	3,208
Information	\$662,688	831
<b>Totals:</b>	<b>\$37,158,721</b>	<b>25,745</b>

Source: Commonwealth Corporation, Workforce Training Fund data.



# 6

## While Massachusetts is Making Great Progress in STEM, there's More to be Done

This kind of sustained investment is important, because as much as Massachusetts leads in STEM, employers still have great unmet need for more STEM employees. For example, job openings in many high-demand STEM occupations—especially in the healthcare and computer/IT sectors—can take 40 to 70 days to fill. Figures like these shine a spotlight on the need for additional post-secondary education and training approaches to help Massachusetts residents gain the skills they need to obtain, or be promoted into, these good jobs.

In Massachusetts  
**40 to 70**  
days to fill  
high-demand  
STEM jobs

### Average Days Needed to Fill High-Demand STEM Jobs in Massachusetts, 2017

Occupation	Sector	Number of Job Postings	Demand	Days to Fill	Estimated Avg. Salary
Speech Pathologist	Health Care	3,618	High	68	\$72,392
Physician	Health Care	14,701	Very High	64	\$125,395
Nurse Practitioner	Health Care	5,870	Very High	60	\$114,567
Occupational Therapist	Health Care	2,227	High	56	\$81,973
Physical Therapist	Health Care	5,584	Very High	54	\$83,664
IT Project Manager	Business Management	3,699	High	53	\$117,421
Electrical Engineer	Engineering	2,660	High	52	\$103,675
Computer Systems Engineer	Information Technology	3,925	High	50	\$122,027
Mechanical Engineer	Engineering	3,000	High	50	\$91,090
Network Engineer	Information Technology	3,534	High	48	\$115,102

**Source:** Labor Insight Jobs, Burning Glass Technologies: STEM Occupation Postings CY 2017.

**Note:** Occupations are ranked by the average number of days a job was posted before being filled.





6

## Continued

In addition, while Massachusetts was recently ranked second among all 50 states in terms of gender equity in STEM employment, the employment gap between women and men in STEM careers is still wide. While women hold more than half of healthcare jobs in Massachusetts, the state has only a modestly higher percentage of women in non-healthcare STEM occupations (29%), compared to the national average (25%). Overall, there are 2.5 men to every woman in STEM jobs, slightly better than the national rate of 3 men for every woman.

In Massachusetts

**2.5**  
men

to **every woman**  
in STEM jobs, slightly  
better than the  
national rate

### Gender Gap in STEM Occupations (excluding Healthcare)

Location	Total # STEM Jobs	# of Jobs Filled by Women	% of Total	# of Jobs Filled by Men	% of Total
Massachusetts	267,005	77,028	29%	189,977	71%
United States	7,840,734	1,990,911	25%	5,849,823	75%

Source: <https://justcapital.com/news/how-few-women-work-in-stem/>



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# 7

## STEM will be Even More Important to Massachusetts Going Forward

Massachusetts' continued efforts to meet the needs of STEM employers, invest in STEM-related education and training initiatives for young people and adult workers, and to continue innovating in these areas is vital, because employment analyses uniformly predict that STEM will only become even more important to Massachusetts in the future. Between 2016 and 2026, the number of jobs in Massachusetts is expected to increase by about 271,000, or 7.4%, but STEM jobs are expected to increase by 11.2%. All told, STEM jobs are expected to account for 25% of the total employment growth in the Commonwealth over the next ten years.

### 2016 - 2026

total jobs expected to increase in Massachusetts by

**7.4%**

STEM jobs expected to increase in Massachusetts by

**11.2%**

### Massachusetts Projections for STEM Occupations, 2016 - 2026

STEM Occupational Groups	Jobs in 2016	Projected Jobs, 2026	Increase	% Increase	Annual Openings*
Healthcare Practitioners	243,783	270,840	27,057	11%	15,750
Computer & Mathematical	146,847	165,803	18,956	13%	12,016
Architecture & Engineering	76,413	81,852	5,439	7%	6,026
Life, Physical, Social Sciences	50,845	56,705	5,860	12%	5,207
Managers, STEM Subset	41,623	46,410	4,787	12%	3,704
Sales Technical, STEM Subset	23,788	25,397	1,609	7%	2,621
Post-secondary Teachers, STEM Subset	19,881	23,696	3,815	19%	2,011
<b>Total STEM Occupations</b>	<b>603,180</b>	<b>670,703</b>	<b>67,523</b>	<b>11%</b>	<b>47,335</b>

**Source:** Commonwealth Corporation analysis of Massachusetts Department of Unemployment Assistance, Economic Research Department, Occupational Projections 2016-2026

**Note\*:** Occupations are ranked by the average number of days a job was posted before being filled. Annual openings are the projected number of annual openings for workers entering occupation. The projected net increase in employment takes into account both projected openings and projected separations (transfers to another occupation and exits from the labor force.)



So as the **Commonwealth of Massachusetts** marks **STEM Week in 2018**, let's celebrate what we've done, take pride in where we are—and be mindful of where we need to go next.

*This report was researched and written by Gene White and Raija Vaisanen of Commonwealth Corporation, with support from Rob Duncan, Stephen Lavery, Susan Lange, J.D. LaRock, Rebekah Lashman, John Niles and Theresa Rowland.*



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