THE CONNECTICUT ECONOMIC DIGEST

DECEMBER 2022

IN THIS ISSUE...

In October...

Nonfarm Employment
  Connecticut 1,668,200
    Change over month .... +0.03%
    Change over year .... +2.24%

  United States 153,308,000
    Change over month .... +0.17%
    Change over year .... +3.58%

Unemployment Rate
  Connecticut 4.3%
  United States 3.7%

Consumer Price Index
  United States 298.012
    Change over year .... +7.7%

STEM To Grow Faster Than Overall Occupations Through 2030

By Matthew Krzyzek, Economist, Department of Labor

S cience, Technology, Engineering, and Math (STEM) occupations are projected to grow faster than all occupations in Connecticut through 2030.[1] These high-growth, good-paying occupations are distributed throughout most major industries in the state and include a variety of career opportunities for Connecticut workers.

The Connecticut Department of Labor discussed our 2020-2030 long-term projections in the September 2022 edition of the Connecticut Economic Digest.[2] That article noted expectations of employment increasing by 201,000 jobs in Connecticut from 2020 to 2030. The industries projected to drive this overall growth include Accommodation & Food Services, Health Care, Transportation & Warehousing, and Professional, Scientific, & Technical Services.[3] The long-term projections are conducted every two years by all 50 states and major territories at the industry and occupational level.

This article focuses on STEM occupations within the long-term projections to illustrate employment expectations for this important segment of the Connecticut economy.

Top Ten STEM Occupations in CT

The ten largest STEM occupations account for 57% of overall STEM employment in the state. Among these ten occupations, four are computer occupations (SOC-15),[4] three are engineering (SOC-17), two are management (SOC-11), and one involves sales (SOC-41). The largest STEM occupation in the state, Software Developers & Analysts (15-1256) had 2020 employment of 19,130 and is expected to grow by 5,280 or 28% to 24,410 by 2030. The other STEM occupations in Figure 1 are projected to grow between 8% and 22% through 2030. These occupations have annual average wages of between $63,380 (Computer User Support Specialist) and $150,629 (Computer & Information

Fig. 1: Top 10 STEM Occupations in CT (# Change)

SOC CODE	Occupation	2020 Base	2030 Projection	# Change	% Change	Annual Openings	Average Annual Wage*
	All STEM Occupations	**114,480**	**132,810**	**18,330**	**16%**	**10,910**	**103,214**
15-1256	Software Developers and Analysts	19,130	24,410	5,280	28%	2,100	109,732
17-2112	Industrial Engineers	6,090	7,460	1,370	22%	560	95,224
15-1232	Computer User Support Specialists	9,090	10,180	1,090	12%	800	63,380
11-3021	Computer and Information Systems Managers	9,820	10,900	1,080	11%	870	150,629
17-2141	Mechanical Engineers	5,320	6,170	850	16%	420	101,866
15-1211	Computer Systems Analysts	7,250	7,840	590	8%	580	102,294
17-2072	Electronics Engineers, Except Computer	2,190	2,770	580	26%	220	105,947
17-2121	Marine Engineers and Naval Architects	1,330	1,840	510	38%	130	N/D
19-1042	Medical Scientists, Except Epidemiologists	1,090	1,570	480	44%	140	138,321
11-9041	Architectural and Engineering Managers	3,870	4,320	450	12%	330	150,487
	All Other STEM Occupations	49,300	55,350	6,050	12%	4,760	95,266

*Source: CT DOL OEWS, 2021 Annual Wages   N/D = No Data

Systems Managers). STEM occupations earned an average of $103,214 overall in 2021, which compares favorably to $67,169 earned on average for all employment in the state.

Industry STEM Distribution

Figure 2 shows the industry distribution of STEM occupational employment for 2020 by two-digit NAICS Code.[5] 76% of STEM employment falls within the top five industries. The largest STEM occupation in 12 of 21 industries was either Software Developers & Analysts (15-1256) or Computer User Support Specialists (15-1232), both of which were the largest in six industries.

Figure 3 includes the ten industries that employed the most STEM workers in 2020 by three-digit NAICS code. (Two digits indicates the broad sector, three digits indicates a particular industry.) Approximately half of all STEM workers in the state were employed within the first three industries, Professional, Scientific, & Technical Services (30,546 STEM workers), Transportation Equipment Manufacturing (17,228 STEM workers), and Insurance Carriers & Related Activities (10,156 STEM Workers).

The Quarterly Workforce Indicators (QWI) provide demographic information on industry employment.[6] Figure 4 includes total employment demographic breakouts for the three industries that employ the most STEM workers. These industry counts include all workers employed in those industries, both STEM and Non-STEM workers combined. When compared to the overall economy, the three STEM-employing industries are older, more male, less diverse, and have higher average education. As the labor force becomes more diverse, the need to broaden the demographic distribution of STEM industry employment will be an important focus for employers looking to expand or replace retiring workers.

Growth and Education

Based on research conducted by the U.S. Department of Labor, each occupation is assigned to an educational category based on the minimum education generally required to enter that occupation nationally. Using these categories, most STEM occupations require a Bachelor's Degree. Our projections show that 84% of Connecticut STEM job growth from 2020 to 2030 will be in occupations that on average require that level of educational attainment. This is more than three times the 25% share of total growth for Bachelor's degree occupations across all occupations. STEM occupations that require a high school diploma or less make up a smaller share of growth than they do for all occupations in the state. Additionally, 11% of STEM growth will be in occupations that on average require either an Associate's Degree or some college courses, which is more than double the 5% growth share across all occupations. An occupation is a broader category than a job. Within each occupation, there may be jobs that require more or less education than is on average required for the occupation as a whole.

HWOL – Job Ads

There were 11,680 job postings for STEM occupations in Connecticut during October 2022 according to Help Wanted Online (HWOL).[7] During the most recent twelve months, "Other" Computer Occupations (SOC 15-1299) had the most STEM job ads, amounting to 20-22% of total STEM ads in a given month. Software Developers and Analysts (15-1256) was the second largest, ranging between 16-19% of total STEM ads. Figure 5 illustrates how STEM job ads over the past year have reached totals that exceed levels during the three prior years.

The distribution of ads by minimum advertised education over the past 12 months had 58% of STEM job ads requiring a Bachelor's, 8% required a High School Diploma, 4% required a Master's or Doctorate, 3% required an Associate's, and 26% did not have a specified educational requirement in the HWOL data. Among ads that specified a specific Bachelor's program, the most

NAICS	Industry	2020 Base	% of Total STEM	SOC Code	SOCTitle	2020 Base	% of Industry
				Largest STEM Occupation in Industry			
0	Total	114,480	100.0%	15-1256	Software Developers & Analysts	19,130	16.7%
54	Professional, Scientific, and Technical Services	30,546	26.7%	15-1256	Software Developers & Analysts	6,116	20.0%
31	Manufacturing	29,491	25.8%	17-2112	Industrial Engineers	5,003	17.0%
52	Finance and Insurance	13,607	11.9%	15-1256	Software Developers & Analysts	2,920	21.5%
61	Educational Services	8,080	7.1%	25-1042	Biological Science Teachers, Postsecondary	1,501	18.6%
51	Information	5,600	4.9%	15-1256	Software Developers & Analysts	1,850	33.0%
55	Management	5,347	4.7%	15-1256	Software Developers & Analysts	1,850	34.6%
67	Self Employed and Unpaid Family Workers, All Jobs	4,900	4.3%	15-1256	Software Developers & Analysts	2,967	60.6%
42	Wholesale Trade	4,568	4.0%	41-4011	Tech. & Sci. Sales Representatives	1,497	32.8%
92	Public Administration	3,869	3.4%	17-2051	Civil Engineers	995	25.7%
62	Health Care and Social Assistance	2,304	2.0%	15-1232	Computer User Support Specialists	496	21.5%
56	Administrative and Support	2,203	1.9%	15-1232	Computer User Support Specialists	578	26.2%
44	Retail Trade	1,067	0.9%	15-1232	Computer User Support Specialists	304	28.5%
23	Construction	800	0.7%	17-2051	Civil Engineers	272	34.0%
22	Utilities	711	0.6%	17-2071	Electrical Engineers	256	36.0%
81	Other Services (except Public Administration)	399	0.3%	15-1232	Computer User Support Specialists	162	40.6%
48	Transportation and Warehousing	334	0.3%	15-1232	Computer User Support Specialists	69	20.7%
53	Real Estate and Rental and Leasing	325	0.3%	15-1232	Computer User Support Specialists	106	32.6%
72	Accommodation and Food Services	148	0.1%	17-3023	Electrical & Electronics Engineering Techs.	60	40.5%
71	Arts, Entertainment, and Recreation	108	0.1%	19-1099	Life Scientists, All Other	43	39.8%
11	Agriculture, Forestry, Fishing and Hunting	73	0.1%	15-1256	Software Developers & Analysts	21	28.8%
21	Mining, Quarrying, and Oil and Gas Extraction	0	0.0%	--	--	--	--

Source: US BLS Projections

Fig. 3: Top STEM Employing Industries

NAICS	Industry	Industry STEM Occ. Emp.	Industry Share of Stem Emp
000	All Industries	114,480	100.0%
541	Professional, Scientific, and Technical Services	30,546	26.7%
336	Transportation Equipment Manufacturing	17,228	15.0%
524	Insurance Carriers and Related Activities	10,156	8.9%
611	Educational Services	8,080	7.1%
551	Management of Companies and Enterprises	5,347	4.7%
671	Total Self Employed and Unpaid Family Workers, All Jobs	4,900	4.3%
423	Merchant Wholesalers, Durable Goods	3,274	2.9%
333	Machinery Manufacturing	3,134	2.7%
334	Computer and Electronic Product Manufacturing	2,712	2.4%
511	Publishing Industries (except Internet)	2,178	1.9%
	All Other STEM Employing Industries	26,925	23.5%

Fig. 4: CT Demographics of 3 Largest STEM industries - Total Employment (STEM & Non-Stem Workers Combined) -2020

	Total All Industries	541 Pro.Sci. Tech	336 Trans. Manuf	524 Insurance Carriers	Total All Industries	541 Pro.Sci. Tech	336 Trans. Manuf	524 Insurance Carriers
Total All Workers	1,531,891	91,721	47,720	57,416	100%	100%	100%	100%
By Age								
Under 25	167,463	5,627	2,765	1,952	11%	6%	6%	3%
25-54	941,164	61,769	28,488	38,234	61%	67%	60%	67%
Over 54	423,261	24,322	16,463	17,227	28%	27%	34%	30%
By Sex								
Male	747,312	48,266	37,564	24,572	49%	53%	79%	43%
Female	784,578	43,454	10,155	32,844	51%	47%	21%	57%
By Education								
Less than high school	165,522	6,224	4,540	3,251	11%	7%	10%	6%
High school	330,478	14,731	11,988	8,873	22%	16%	25%	15%
Some college or Associate degree	404,447	22,002	13,861	14,431	26%	24%	29%	25%
Bachelor's degree or higher	463,980	43,135	14,564	28,907	30%	47%	31%	50%
Ed. Attain. NA (workers under age 25)	167,463	5,628	2,766	1,953	11%	6%	6%	3%
By Race								
White	1,211,257	74,226	41,119	48,744	79%	81%	86%	85%
Black	200,906	4,791	3,091	4,235	13%	5%	6%	7%
Amer. Indian or Alaska Native	8,007	264	168	108	1%	0%	0%	0%
Asian	80,562	11,142	2,582	3,597	5%	12%	5%	6%
Native Hawaiian or P.I.	2,405	98	40	45	0%	0%	0%	0%
2 or more	28,752	1,199	718	684	2%	1%	2%	1%
By Ethnicity								
Not Hispanic or Latino	1,311,777	85,355	44,045	54,103	86%	93%	92%	94%
Hispanic or Latino	220,113	6,366	3,675	3,312	14%	7%	8%	6%

Source US Census, QWI

common were Computer Science, Business Administration, Mechanical Engineering, Electrical Engineering, and Information Technology.

The two-digit industries with the most STEM job ads unsurprisingly are the three with the most 2020 STEM employment. Manufacturing had 11,093 STEM ads over the year, Professional, Scientific, & Technical Services had 9,176, and Finance & Insurance had 7,009. Some of the STEM occupations with the most job ads were industry-specific, such as Mechanical Engineers in Manufacturing or Actuaries in Finance & Insurance, but all three of the industries included occupations that fall within Computer Occupations (SOC-15). The most common occupation among those three industries was "Other" Computer Occupations (SOC 15-1299).

STEM and Adjacent States

STEM occupations are expected to outpace overall employment growth nationally, within Connecticut, and within most adjacent states (see Figure 7). STEM employment growth is expected to be faster than overall area employment growth in the
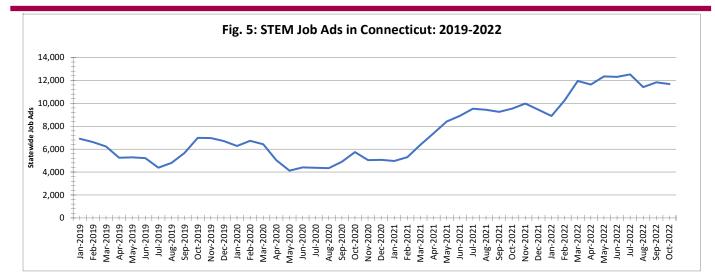
Fig. 5: STEM Job Ads in Connecticut: 2019-2022

Fig. 6: Total STEM Job Ads - 12 Months Ending October 2022

Manufacturing	Ads
All STEM Occupations	11,093
Computer Occupations, All Other (15-1299)	1,501
Engineers, All Other (17-2199)	1,497
Software Developers and Analysts (15-1256)	1,107
Mechanical Engineers (17-2141)	831
Architectural and Engineering Managers (11-9041)	534
All other STEM Occupations	5,623

Pro., Sci., & Tech. Services	Ads
All STEM Occupations	9,176
Computer Occupations, All Other (15-1299)	2,370
Software Developers and Analysts (15-1256)	1,894
Computer Systems Analysts (15-1211)	497
Information Security Analysts (15-1212)	415
Computer User Support Specialists (15-1232)	363
All other STEM Occupations	3,637

Finance and Insurance	Ads
All STEM Occupations	7,009
Computer Occupations, All Other (15-1299)	2,008
Software Developers and Analysts (15-1256)	1,711
Actuaries (15-2011)	464
Computer Systems Analysts (15-1211)	429
Information Security Analysts (15-1212)	365
All other STEM Occupations	3,657

U.S., Connecticut, Massachusetts, and Rhode Island. In Connecticut, STEM is projected to grow by over 18,000 jobs through 2030 and by over 208,000 among Connecticut, New York, Massachusetts, and Rhode Island.[8]

Annual Openings

Nationwide there are expected to be over 860,000 annual openings in STEM occupations through 2030, this count includes openings from overall employment growth, transfers (the remaining vacancy when someone leaves an occupation for another) and exits (when someone leaves the labor force).[9] There are expected to be over 10,000 annual STEM openings in Connecticut, and over 100,000 annual STEM openings in Connecticut and its neighboring states. While growth is important, the vast majority of hiring is to replace workers who have left the labor force (such as for retirement) or who have moved on to other occupations. Openings capture both new jobs and replacement hiring.

Largest STEM Occupation Statewide

Demand for STEM workers is projected to grow nationally, in Connecticut, and in our neighboring states (Figure 7). The largest STEM occupation and the one with the largest projected growth is Software Developers & Analysts (15-1256). Within Connecticut and nearby states, this occupation ranged between 14% (Rhode Island) and 25% (Massachusetts) of 2020 STEM statewide employment and accounts for between 29% (CT & RI) and 40% (Massachusetts) of STEM statewide growth through 2030. This occupation involves work activities that include analyzing user needs and developing software, troubleshooting computer application issues, and compiling technical information.[10] This high-growth STEM occupation is expected to have 2,100 openings per year in Connecticut which equates to 11% of 2020 base-year employment.

Conclusions

STEM occupations represent a growing and high-paying segment of the labor market. These occupations are integrated into

Fig. 7: STEM and Total Projections through 2030: CT and Adjacent States

Area	Occupational Category	2020 Base	2030 Projection	# Change	Annual Openings
United States	All Occupations	153,533,800	165,413,700	11,879,900	18,474,400
	STEM	9,636,700	10,665,200	1,028,500	860,800
Connecticut	All Occupations	1,685,760	1,887,260	201,500	210,690
	STEM	114,480	132,810	18,330	10,910
Massachusetts	All Occupations	3,518,610	4,257,490	738,880	478,780
	STEM	303,810	386,610	82,800	34,070
Rhode Island	All Occupations	491,000	547,130	56,130	61,390
	STEM	25,930	29,490	3,560	2,360
New York	All Occupations	9,670,010	12,083,650	2,413,640	1,410,700
	STEM	514,150	617,480	103,330	52,990

CT DOL Anlaysis of BLS Projections

every major industry in the state. They are expected to grow 34% faster than the overall economy through 2030 and currently earn 54% more than the statewide average wage. The current demographics of employment in industries that employ a large share of STEM workers suggest that the STEM workforce will have to become younger and more diverse to meet the expected employment growth and replacement needs through 2030. Most STEM jobs require a Bachelor's or More, but compared to the overall labor force, a larger share of STEM employment requires an Associate's or Some College, which indicates that there are employment opportunities for workers at every educational attainment level. In the past year, STEM occupations have had an increasing share of total job ads and are expected to have over 100,000 annual openings within

Connecticut and its neighboring states through 2030. ■

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1 BLS Definition of STEM: https://www.bls.gov/oes/topics.htm#stem

2 CT Economic Digest. Long Term Industry and Occupational Projections: 2020-2030. Sept. 2022. https://www1.ctdol.state.ct.us/lmi/digest/pdfs/cedsep22.pdf

3 Projections available here: https://projectionscentral.org/

4 SOC is Standard Occupational Classification. The first two digits of a SOC Code indicate the major group. https://www.bls.gov/soc/home.htm

5 NAICS is the North American Industrial Classification System. Information about NAICS is available here: https://www.census.gov/naics/

6 The QWI come from the Longitudinal

Employer Household Dynamics (LEHD) program of the U.S. Census. More information regarding LEHD including QWI is available here: https://lehd.ces.census.gov/

7 The latest Help Wanted Online (HWOL) information is available here: https://www1.ctdol.state.ct.us/lmi/hwol.asp

8 All states produce projections using the same methodology. CT DOL does not produce projections for other states. See www.projectionscentral.org

9 BLS Handbook of Methods. Employment Projections Calculation. https://www.bls.gov/opub/hom/emp/calculation.htm#occupational-employment-and-openings

10 BLS Occupational Outlook Handbook. Software Developers and Quality Assurance Analysts and Testers. https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm

GENERAL ECONOMIC INDICATORS

(Seasonally adjusted)	3Q 2022	3Q 2021	YoY CHG NO.	%	2Q 2022	QoQ CHG NO.	%
General Drift Indicator (2007=100)*							
Leading	110.7	105.0	5.7	5.5	112.7	-2.0	-1.7
Coincident	96.2	94.8	1.4	1.5	96.3	-0.1	-0.1
Real Gross Domestic Product**	**1Q 2022**	**1Q 2021**	**YoY CHG NO.**	**%**	**4Q 2021**	**QoQ CHG NO.**	**%**
(Millions of chained 2012 dollars)							
Connecticut	250,201	240,712	9,489	3.9	251,071	-870	-0.3
United States	19,727,918	19,055,655	672,263	3.5	19,806,290	-78,372	-0.4
New England	1,025,942	979,373	46,570	4.8	1,026,499	-557	-0.1
Per Capita Personal Income**	**2Q 2022**	**2Q 2021**	**YoY CHG NO.**	**%**	**1Q 2022**	**QoQ CHG NO.**	**%**
(Current $, SAAR)							
Connecticut	84,963	82,387	2,576	3.1	84,550	413	0.5
United States	64,993	63,018	1,975	3.1	64,113	880	1.4
New England	78,751	77,160	1,591	2.1	78,144	607	0.8
Philadelphia Fed's Coincident Index (2007=100)*	**Oct 2022**	**Oct 2021**	**YoY CHG NO.**	**%**	**Sep 2022**	**MoM CHG NO.**	**%**
Connecticut	120.92	115.84	5.08	4.4	121.49	-0.58	-0.5
United States	135.81	129.84	5.97	4.6	135.61	0.20	0.1

*Sources: *Dr. Steven P. Lanza, University of Connecticut, https://steven-lanza.uconn.edu/the-connecticut-green-sheet/*
***U.S. Bureau of Economic Analysis ***Federal Reserve Bank of Philadelphia*

General Drift Indicators are composite measures of the four-quarter change in three coincident (Connecticut Manufacturing Production Index, nonfarm employment, and real personal income) and three leading (housing permits, manufacturing average weekly hours, and initial unemployment claims) economic variables, and are indexed so 2007 = 100.

The **Philadelphia Fed's Coincident Index** summarizes current economic condition by using four coincident variables: nonfarm payroll employment, average hours worked in manufacturing, the unemployment rate, and wage and salary disbursements deflated by the consumer price index (U.S. city average).