

A man wearing a camouflage baseball cap with an orange logo and a grey button-down shirt is sitting at a wooden desk. He is focused on writing in a notebook with a green pen. On his left wrist, he wears a black watch. Several open books are scattered on the desk in front of him. The background is a blurred library or study area with bookshelves and a hanging lamp.

LEAP 2016 OCCUPATIONAL ANALYSIS



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An excel file of data used in this report may be downloaded [here](#).

INTRODUCTION

Under the leadership of Gov. Bill Haslam and Department of Economic and Community Development Commissioner Randy Boyd, Tennessee continues to experience unprecedented growth. Current private sector employment has increased to 2,551,100, up 15.8 percent from the beginning of the Haslam Administration. Tennessee leads the nation in FAFSA (Free Application for Federal Student Aid) filings, accounting for more than 40 percent of national FAFSA growth in 2015. According to the Lumina Foundation, Tennessee has increased the state educational attainment rate from 33.8 percent to 39.3 percent with the inclusion of certificates. The state has seen a decrease in unemployment to 4.6 percent, ranking ahead of the national rate of 5.0 percent as of September 2016.

Tennessee has the lowest state debt per capita in the nation according to Tax Foundation's Annual Facts & Figures report, and currently ranks No. 1 in the Southeast and No. 2 in the nation for real GDP growth year-over-year at 4.0 percent growth from Q1.2015 to Q1.2016.

The Brookings Institute ranked Tennessee No. 1 among U.S. states for advanced industry job growth. From 2013 to 2015, Tennessee's advanced industry jobs increased by an average of 4.6 percent annually, outpacing the national average of 2.46 percent. Tennessee ranked No. 1 in automotive manufacturing strength for five of the past seven years, currently providing more than 123,000 employment opportunities within the three OEMs (General Motors, Nissan and Volkswagen) and over 920 automotive suppliers statewide.

Tennessee is also achieving international successes, ranking No. 1 for foreign direct investment (FDI) job commitments in 2015, according to the recently released 2016 Global Location Trends report.

This positive economic trend is due in large part to the vision of Drive to 55, Gov. Haslam's initiative to ensure 55 percent of Tennesseans obtain a postsecondary credential by the year 2025, and the creation and implementation of multiple state strategies to achieve the goal.

TENNESSEE WORKFORCE DEVELOPMENT INITIATIVES

TENNESSEE PROMISE

Tennessee Promise provides high school students two years of tuition-free community or technical college for up to five semesters. In addition to removing the financial barrier, the program also provides students with a volunteer mentor to help guide them through the college application process. In return, the student must attend mandatory meetings, meet critical deadlines, complete eight hours of community service each semester, and maintain a 2.0 GPA throughout their tenure. Tennessee Promise is administered in partnership with tnAchieves, formerly known as Knox Achieves prior to the statewide initiative.

From 2008 to 2014, the program has supported more than 10,000 students entering into a community or technical college with more than \$15.5 million raised in private funds dedicated exclusively to last-dollar student scholarships. Statistics indicate Tennessee Promise students are retaining and graduating at a rate 50 percent greater than the state average, 65 percent of the students are first generation college attendees, 70 percent come from families who earn less than \$50,000 annually, and 94 percent of graduates reported completion of postsecondary education debt free.

The Class of 2015 was comprised of 16,291 students, resulting in a 24 percent increase of full-time students at community college, while technical college enrollment increased more than 20 percent. This represents a 10 percent overall increase in Tennessee public higher education enrollment and an unprecedented 4.6 percent increase in the state's college-going rate. This percent increase is more than the previous seven years (2007-2014) combined.

TENNESSEE RECONNECT

The Drive to 55 mission cannot be attained without the participation of adults with a postsecondary degree or credential. Tennessee Reconnect uses Tennessee Reconnect communities to focus on and serve between 900,000 and one million adults who have completed some college, but have not obtained a certificate or credential. Currently, all Tennessee adults can now earn a diploma or certificate at any of the 27 Tennessee Colleges of Applied Technology (TCATs) completely free of tuition and fees. There are also opportunities to attend community college, and a veteran-specific Tennessee Reconnect program has recently been created.

TENNESSEE LABOR AND EDUCATION ALIGNMENT GRANT (LEAP)

Spearheaded by Senate Majority Leader Mark Norris, LEAP has changed the culture of how Tennesseans address and tackle workforce challenges. Governor Haslam and the Tennessee Legislature has provided \$20M in competitive grant funding to eliminate skills gaps across the state in a proactive, data-driven, and coordinated manner by encouraging collaboration across education and industry.

GOVERNOR'S WORKFORCE SUBCABINET

The Governor's Workforce Subcabinet continues to play a fundamental role in the creation of workforce development programs and the alignment of industry and education. In 2016, Gov. Haslam provided a second round of \$10 million to be distributed by means of a competitive RFP through the Workforce Subcabinet.

The following programs have been selected to receive LEAP funding in 2016:

- Advanced Manufacturing in East Tennessee Powered by the Drive to 55 LEAP Grant East Tennessee Development District; TCAT Knoxville
- Advanced Manufacturing Skills and Internship Program Southeast Tennessee Development District; Chattanooga State Community College
- The Marine and Advanced Engineering System Technology Regional Occupations Blount Partnership; Pellissippi State Community College, Cleveland State Community College, TCAT Knoxville
- Mechatronics-to-Jobs (M-2-J) Workforce Essentials, (Local Workforce Investment Area 8); Volunteer State Community College
- Mechatronics: A Pipeline from Dual Enrollment to TCAT to Work-Based Learning Joint Economic and Community Development Board of Cheatham County; TCAT Dickson
- Mechatronics Accelerated Completion Program South Central Workforce Alliance; Columbia State Community College
- Nashville Area Automotive and Diesel Pathway
- Local Workforce Development Board Area 9; TCAT Nashville, Nashville State Community College, Tennessee State University
- Results Matter: Providing Qualified Healthcare Professional to Meet Workforce Needs in Southern Middle Tennessee
- South Central Tennessee Workforce Alliance; Columbia State Community College
- South Central Tennessee LEAP Forward for Industrial Technology Training
- South Central Tennessee Development District; TCAT Hohenwald
- Strengthening the Lakeway Links 2.0 – Providing a Demand Driven Workforce Supply Chain
- Smoky Mountain Area Workforce Board, Local Workforce Development Area 2; TCAT Morristown, Walters State Community College
- TCATs: Taking Charge of Applied Training – A Workforce Development Commitment to West Tennessee and Memphis Regional Megasite
- Southwest Tennessee Development District; TCATs Jackson, Covington, Crump, McKenzie, Memphis, Newbern, Paris, Ripley, and Whiteville
- Tennessee Central Cooperative Manufacturing Education Program
- Greater Nashville Regional Council; TCAT Hartsville

ADVISE TN

Advise TN is a college advising and capacity building program driven by the belief that every student has the potential to attend and thrive in postsecondary education. Advise TN aims to increase the number of Tennesseans accessing higher education by partnering with high schools and providing college advising services to up to 10,000 junior and senior students across Tennessee. The program began in fall 2016 and will provide services at participating high schools with the intention of helping students enroll in the postsecondary option where the student will be most likely to succeed and persist to a degree or credential. This includes a four-year university, community college, Tennessee College of Applied Technology or other form of quality postsecondary education.

DRIVE TO 55 CAPACITY FUND

Gov. Haslam has dedicated \$24.5 million to be administered to postsecondary institutes by way of a competitive RFP to build and/or expand physical and programmatic campus resources to meet the increased enrollment numbers due to Tennessee Promise and Tennessee Reconnect. These awards will be announced in November 2016.

COMPLETE TN

Launched in the fall of 2016 as nonprofit 501(c)3 education advocacy organization, Complete TN is focused on increasing postsecondary access and completion in all post-secondary programs in Tennessee. The work centers on four primary focus areas of community engagement, advocacy and accountability, leadership development, and innovation to identify best practices and initiatives to promote post-secondary attainment and completion.

WORKFORCE360°

The Department of Economic and Community Development houses Workforce360°, an initiative which brings together multiple state agencies to a single meeting with business to discuss workforce challenges and identify specific strategic solutions. This approach creates an efficient and effective method for working with business across the state and increases the opportunity to leverage state resources.

State partners include Tennessee Colleges of Applied Technology, Tennessee Community Colleges, Tennessee 4-Year universities, Tennessee Departments of Education, Labor and Workforce Development, and Human Services, and the Tennessee Higher Education Commission. These collaborative meetings can occur at a local, regional, or state level and result in better alignment of education and industry.

DISTRESSED COUNTIES

The Tennessee Department of Economic and Community Development recognizes that the unprecedented job growth, increased educational attainment and rising incomes occurring in many Tennessee counties is not being experienced by all Tennessee counties. Specifically, many rural counties continue to struggle. In fiscal year 2016, Tennessee was home to 21 distressed counties, ranking in the bottom 10 percent nationally for per capita market income, poverty rate and unemployment rate. In fiscal year 2017, Tennessee is home to 17 nationally distressed counties. The department will continue to focus on these counties through initiatives under the leadership of Assistant Commissioner of Rural Development Amy New until the ultimate goal of zero distressed counties is met.

UTILIZING LEAP REPORT 2016

Pursuant to Section 10 of Public Chapter 338, the Tennessee Department of Economic and Community Development will submit a report to partner agencies on demonstrated workforce needs within existing and prospective businesses across the state. The following report fulfills this requirement.

LEAP 2016 Occupational Analysis identifies 255 in-demand occupations based on high hires, openings, and/or postings relative to total employment. In addition, postsecondary programs of study linked to production, information technology, engineering and healthcare occupations are outlined regionally, showing alignment and opportunities for alignment between education and industry in Tennessee.

This report is meant to aid in local, regional and state policy decision-making by clearly depicting in-demand occupations and highlighting opportunities to reduce education gaps. The following are six specific examples of how to best consume and utilize the LEAP 2016 Occupational Analysis.

- 1) **Community Education:** This report can be used as a teaching resource to inform youth, adults, traditional and non-traditional students, teachers, guidance counselors, parents, chambers of commerce and economic development professionals about in-demand occupations in Tennessee.
- 2) **Potential Increase in Postsecondary Offerings:** This report can be used to identify gaps in educational programming connected to in-demand occupations and depict opportunities to develop postsecondary programs aligned to the demonstrated need.
- 3) **Potential Increase in K-12 Offerings:** This report can be used to identify gaps in secondary educational programming with alignment to in-demand opportunities. Companies can also increase partnerships with school systems through career exploration courses, guest speaker events, facilitating industry tours and providing work experiences for K-12 students.
- 4) **Increased Education and Industry Partnerships:** This report highlights the need and opportunities for increased education and industry alignment. Both partners have the ability to proactively approach one another to explore strategies.
- 5) **Expanded Education Work Experiences:** The best way to learn about an occupation is to experience it firsthand. Programs such as work-based learning, internships, co-ops and apprenticeships are valuable opportunities for the company and student, as well as the educational institution. In addition, there are state and federal resources available to support the expansion of these programs.
- 6) **Data Support:** The data from this report and the full download can be utilized in applications to pursue local, state and federal grants attainment.

Tennessee is poised to continue to experience extraordinary growth for the foreseeable future. The specific rate of success will be contingent on the readiness of a current workforce, the availability of a strong workforce pipeline and the statewide alignment of education and industry.

OCCUPATIONAL ANALYSIS: JOBS WITH HIGH EMPLOYER DEMAND

The Center for Economic Research in Tennessee (CERT) conducted an analysis to identify jobs for which Tennessee employers have a high demand to fill. For each of the state's nine regions, CERT analyzed occupations with high numbers of job postings, hires and/or job openings relative to an occupation's total employment.

In total, CERT identified 255 job classifications¹ with high employer demand in one or more Tennessee regions. Out of 785 job classifications, CERT identified for each region a number of in-demand job classifications ranging from 87 to 133. The Northern Middle region of Tennessee had 133 occupations identified as in-demand, which was more than any other region. In the Northern Middle region of Tennessee, these occupations had 362,573 unique job postings in 2015; 208,936 hires in 2015; and 91,523 job openings between 2010 and 2015. In the Upper Cumberland region of Tennessee, 87 occupations were identified with high employer demand. For these occupations, the Upper Cumberland region had 42,817 unique job postings; 15,003 hires in 2015; and 6,618 job openings between 2010 and 2015. Data for each region's in-demand job classifications is available for download at <http://www.tnecd.com/research-and-data/publications/>.

Tennessee Region	Number of Occupations with High Employer Demand	For Job Classifications in High Demand:		
		Unique Job Postings (2015)	Hires (2015)	Openings (2010 -2015)
Greater Memphis	94	134,559	81,387	22,293
Northwest	92	38,901	12,389	5,372
Southwest	73	39,193	14,665	6,412
Northern Middle	133	362,573	208,936	91,523
Southern Middle	103	66,456	24,921	13,649
Upper Cumberland	87	42,817	15,003	6,618
East	100	144,749	79,400	32,020
Southeast	100	92,761	52,955	20,715
Northeast	95	56,836	26,182	11,201
Total	255	978,845	515,838	209,802

This report highlights a few occupation groups which have high employer demand across the state:

- Production occupations (see page 10),
- Information technology occupations (see page 14),
- Healthcare occupations (see page 22), and
- Engineering and engineering-related occupations (see page 18).

For each of these occupation groups, programs offered at Tennessee colleges and universities are highlighted which support and supply the workforce for occupations with high employer demand.

While four occupation groups are highlighted in this report, nearly every occupation group has occupations in high demand. The table below reflects the total number of job classifications within each group, and the share of those occupations identified as in-demand. Management had the greatest share of in-demand job classifications (24 of 34 management occupations identified as in-demand), followed by computer and mathematical occupations (12 of 19 computer and mathematical occupations identified as in-demand), and sales (13 of 22 sales occupations identified as in-demand). Detailed data for all in-demand occupations is available in Appendix A and in the regional files available for download.

¹The 255 occupations with high employer demand in one or more Tennessee regions are provided in Appendix A.

Occupation Group	Occupations with High Employer Demand in 1 or More Regions	All Occupations in Group
Management (11-0000)	24	34
Business and Financial Operations (13-0000)	15	32
Computer² and Mathematical (15-0000)	12	19
Architecture and Engineering³ (17-0000)	17	35
Life, Physical, and Social Science (19-0000)	7	43
Community and Social Service (21-0000)	9	18
Legal (23-0000)	-	9
Education, Training, and Library (25-0000)	4	27
Arts, Design, Entertainment, Sports, and Media (27-0000)	10	41
Healthcare Practitioners and Technical⁴ (29-0000)	20	61
Healthcare Support⁵ (31-0000)	7	17
Protective Service (33-0000)	7	22
Food Preparation and Serving Related (35-0000)	1	18
Building and Grounds Cleaning and Maintenance (37-0000)	5	10
Personal Care and Service (39-0000)	2	33
Sales and Related (41-0000)	13	22
Office and Administrative Support (43-0000)	18	56
Farming, Fishing, and Forestry (45-0000)	3	15
Construction and Extraction (47-0000)	17	60
Installation, Maintenance and Repair (49-0000)	22	52
Production⁶ (51-0000)	27	108
Transportation and Material Moving (53-0000)	15	52
Military (55-0000)	-	1
TOTAL	255	785

SCIENCE, TECHNOLOGY, ENGINEERING AND MATH (STEM)

Twenty-three percent of the jobs identified in this analysis are STEM or STEM-related occupations (60 of the 255 in-demand occupations). Science, Technology, Engineering and Math (STEM) occupations are high-wage jobs with many openings in Tennessee. Twelve percent of Tennessee's 2015 annual openings are in STEM and STEM-related fields. STEM and STEM-related jobs are projected to grow by 19 percent in Tennessee in the next ten years (2015-2025); over the same time period, all occupations are projected to grow 12 percent.

Most of the regionally in-demand STEM and STEM-related occupations are within the IT, engineering and healthcare occupation groups, which are highlighted in this report. In the regional files available for download, STEM and STEM-related occupations are identified.

²See page 14 for a list of computer (or IT) occupations with high employer demand in one or more Tennessee regions.

³See page 18 for a list of the 14 engineering occupations with high employer demand in one or more Tennessee regions.

⁴See page 22 for a list of the 20 healthcare practitioners and technical occupations with high employer demand in one or more Tennessee regions.

⁵See page 22 for a list of the 7 healthcare support occupations with high employer demand in one or more Tennessee regions.

⁶See page 10 for a list of the 27 production occupations with high employer demand in one or more Tennessee regions.

METHODOLOGY

To measure jobs which have “high” employer demand relative to average or low employer demand, CERT analyzed postings, hires and openings for an occupation relative to total employment in the occupation. Occupations which meet at least two of these three requirements, based on 2015 data, are identified to have high employer demand:

1. The ratio of job postings (2015) to employment for an occupation is greater than or equal to the median ratio for all jobs in the region.
2. The ratio of hires (2015) to employment for an occupation is greater than or equal to the median ratio for all jobs in the region.
3. The ratio of job openings (2010-2015) to employment for an occupation is greater than or equal to the median ratio for all jobs in the region.

In order to encourage job creation and skill development in high quality jobs, CERT set a minimum wage threshold for jobs included in the analysis. All occupations identified in this report have a median wage which is at least 75 percent of the median wage for the region.

Occupations employing less than 0.04 percent of the region’s total employment are excluded from this report.

DATA DEFINITIONS:

Unique Job Postings: ‘Unique Job Postings’ denotes the number of de-duplicated job advertisements listed by different companies on online career sites or job boards. De-duplication is a process used to count a job posting only once even if there are listings of the same job on multiple career sites or jobs boards.

Hires: A hire is reported by the Census Bureau’s Quarterly Workforce Indicators (QWI) when an individual’s Social Security number appears on a company’s payroll and was not there the quarter before. The QWI program produces a comprehensive tabulation of employment and wage information for workers covered by state unemployment insurance laws, similar to the BLS QCEW program.

Openings: EMSI estimates the change in new jobs and replacement jobs. ‘New Jobs’ estimates the change in the total number of workers employed in an occupation. ‘Replacement Jobs’ estimates the workers that are permanently leaving an occupation. The sum of new jobs and replacement jobs indicates openings

Concentration of Employment: Concentration of employment compares an occupation’s share of total employment within a region to that occupation’s share of total employment in the nation.

SOURCE:

Data in this report comes from Economic Modeling Specialists, Intl. (EMSI). (2016.3 Class of Worker).

Major data sources for the 2016.3 EMSI release include: BLS Quarterly Census of Employment & Wages 2015Q4; BLS Current Employment Statistics May 2016; BLS Occupational Employment Statistics 2015; BLS Natl. Employment Projections 2014-2024; BEA State Personal Income 2014; BEA Local Area Personal Income 2014; Census Bureau American Community Survey 2005-2014; Census Bureau Quarterly Workforce Indicators (QWI) 2016Q1; US Department of Education National Center for Education Statistics Integrated Postsecondary Education Data System (IPEDS).

IPEDS Data: The Integrated Postsecondary Education Data System (IPEDS) from the U.S. Department of Education is the source of postsecondary program completion data incorporated into EMSI and this report. IPEDS is a very comprehensive data source because institutions, public and private, that participate in federal student aid programs are required by the Higher Education Act of 1965 to report their data to IPEDS. These institutions self-report, so there is a possibility for errors and inconsistencies.

PRODUCTION OCCUPATIONS

Throughout Tennessee, employers are seeking out individuals interested in production positions. Colleges and training facilities provide programs that prepare jobseekers with the skill sets needed to work in production. Production occupations located in almost every region throughout the state have training programs that can help jobseekers acquire skills needed to perform a job.

The table below outlines production occupations that have high employer demand in one or more Tennessee regions. In the table, an “X” denotes high demand for an occupation in the specific individual region of Tennessee. There are several training programs jobseekers can access to obtain the necessary skill sets to work in production. A few key programs are identified in the table below, but do not encompass all training programs available.⁷ The letters in the “Related Programs” column of the table correspond to key programs for production, which are outlined in the following pages.

IN-DEMAND PRODUCTION OCCUPATIONS

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Related Programs ^a
51-2022	Electrical and Electronic Equipment Assemblers	x		x	x		x		x	x	6	a
51-2041	Structural Metal Fabricators and Fitters			x							1	b, c
51-2092	Team Assemblers	x	x		x		x	x	x		6	
51-2099	Assemblers and Fabricators, All Other			x				x			2	
51-3021	Butchers and Meat Cutters	x						x			2	
51-3092	Food Batchmakers		x	x		x		x			4	
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	x	x		x			x	x		5	b, d
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic								x		1	b
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic								x		1	e, b
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic								x		1	e
51-4041	Machinists			x	x	x		x	x		5	e, b
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic								x		1	
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic								x		1	e, b
51-4121	Welders, Cutters, Solderers, and Brazers			x	x	x	x	x	x		6	f
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders					x					1	f
51-5112	Printing Press Operators		x								1	
51-6093	Upholsterers		x								1	
51-7011	Cabinetmakers and Bench Carpenters			x							1	

⁷This report identifies only a few key programs available to support the jobs which are in demand; not all available educational programs are highlighted. The programs were identified using Economic Modeling Specialists Intl. (EMSI), which has a crosswalk between occupations and programs.

^aSee corresponding programs in the following pages.

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Related Programs ^o
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood						x	x			2	
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing				x						1	
51-8031	Water and Wastewater Treatment Plant and System Operators							x			1	
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers			x	x				x		3	
51-9111	Packaging and Filling Machine Operators and Tenders	x	x	x				x		x	5	
51-9151	Photographic Process Workers and Processing Machine Operators						x				1	
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic			x							1	
51-9198	Helpers--Production Workers			x							1	
51-9199	Production Workers, All Other			x	x	x	x	x	x	x	7	

KEY TRAINING PROGRAMS FOR PRODUCTION

A. INDUSTRIAL ELECTRONICS TECHNOLOGY/TECHNICIAN (CIP 47-0105)

This program prepares students for careers as electrical and electronic equipment assemblers (SOC 51-2022). This position is in high demand in five of the state's nine regions.

In 2015, there were 1,385 unique electrical and electronic equipment assemblers job postings in Tennessee, and 2,981 hires were made. Both of these activities indicate that Tennessee businesses have a high demand for this occupation. The median wage for this job in Tennessee is \$14.12 per hour. Electrical and electronic equipment assemblers require a high school diploma, however this program provides students with greater job opportunities and skill sets that employers desire.

There are seven TCATs which awarded a total of 68 certificates for this program in 2015.

TCAT-Athens (13)	TCAT-Crump (12)	TCAT-Memphis (11)	TCAT-Crossville (10)
TCAT-Pulaski (10)	TCAT-Hohenwald (9)	TCAT-McKenzie (3)	

B. MACHINE SHOP TECHNOLOGY/ASSISTANT (CIP 48-0503)

This program prepares students for six of the production occupations identified as in high demand in Tennessee's regions: *Structural metal fabricators and fitters (51-2041); Computer-controlled machine tool operators (51-4011); Extruding and drawing machine setters, operators and tenders, metal and plastic (51-4021); grinding, lapping, polishing and buffing machine tool setters, operators and tenders (51-4033); machinists (SOC 51-4041); and multiple machine tool setters, operators and tenders (51-4081)*

^oSee corresponding programs in the following pages.

There are 12 Tennessee institutions which awarded 158 certificates for this program in 2015.

TCAT Knoxville (33)	TCAT-Morristown (28)	TCAT-Shelbyville (18)	TCAT-Crump (18)	TCAT-Jackson (15)
TCAT-Livingston (13)	TCAT-Crossville (8)	TCAT-Jacksboro (8)	TCAT-McKenzie (7)	TCAT-Athens (6)
TCAT-Whiteville (6)	TCAT-Paris (5)	William Moore College of Technology (4)		

C. METAL FABRICATOR (CIP 48-0511)

The metal fabricators program prepares students for jobs as structural metal fabricators and fitters (51-2041). This occupation was identified as in-demand in Southern Middle Tennessee, where there were 69 openings for this job from 2010 through 2015 and 96 hires in 2015. This posting and hiring activity is very high relative to Southern Middle Tennessee's current employment in the occupation (170 jobs in 2015).

The only institution in Tennessee which offers this program is TCAT-Paris, which awarded 18 program completions in 2015.

D. COMPUTER NUMERICALLY CONTROLLED (CNC) MACHINIST TECHNOLOGY/CNC MACHINIST (CIP 48-0510)

The CNC program prepares students for two occupations: *Computer-controlled machine tool operators* (SOC 51-4011); and *computer numerically controlled machine tool programmers* (SOC 51-4012). The first of these two occupations is in high demand in five of Tennessee's nine regions.

During 2015, Tennessee employers posted 840 job openings for this occupation, and 840 hires were made. This is a high degree of posting and hiring activity relative to the workforce size – currently there are 2,244 computer-controlled machine tool operators employed in Tennessee. Tennessee employment in this occupation has increased 16.2 percent from 2010 to 2015, however employment concentration in Tennessee is 25 percent below the national average. Median wages for this occupation are \$17.81 per hour in Tennessee.

TCAT-Pulaski is the only Tennessee institution which offers this program. The TCAT awarded 7 certificates in 2015.

E. MACHINE TOOL TECHNOLOGY/MACHINIST (CIP 48-0501)

This program prepares students for careers as *machinists* (SOC 51-4041) – an occupation which is in demand in five of Tennessee's nine regions. There are 8,575 machinists employed in Tennessee, earning median wages of \$18.44 per hour (\$38,355 per year). Machinist employment in Tennessee grew 23.7 percent from 2010 through 2015, and concentration of machinists in the state is 6 percent above the national average concentration. In 2015, there were 1,608 unique machinist job postings in Tennessee, and 5,000 hires were made. Machinists require a high school diploma, however this program provides job-seekers with expertise and improved job opportunities.

This program prepares students for many other jobs, including three fields that are in demand in the Southeast region of Tennessee: *Grinding, lapping, polishing and buffing machine tool setters, operators, and tenders* (SOC 51-4033), which had 113 openings and 156 hires in the Southeast region during 2015; *Lathe and turning machine tool setters, operators and tenders* (SOC 51-4034), which had 49 openings and 84 hires in Southeast Tennessee during 2015; and *multiple machine tool setters, operators and tenders* (SOC 51-4081), which had 86 openings and 156 hires in the Southeast Tennessee region during 2015.

There are 13 Tennessee institutions which had completions from this program in 2015. 167 students completed this program with a certificate in 2015, and two students completed the program with an associate degree.

TCAT Knoxville (33)	TCAT-Morristown (28)	TCAT-Shelbyville (18)	TCAT-Crump (18)	TCAT-Jackson (15)
TCAT-Livingston (13)	TCAT-Crossville (8)	TCAT-Jacksboro (8)	TCAT-McKenzie (7)	TCAT-Athens (6)
TCAT-Whiteville (6)	TCAT-Paris (5)	William Moore College of Technology (4)		

F. WELDING TECHNOLOGY/WELDER (48-0508)

The welding program provides training for two target occupation groups: *welders, cutters, solderers and brazers (SOC 51-4121)*; and *welding, soldering and brazing machine setters, operators and tenders (SOC 51-4122)*. Welding occupations are in demand in six regions of Tennessee. These two occupation groups employ 10,233 people in Tennessee. The welding occupations have grown 17.0 percent from 2010 to 2015. In 2015, Tennessee employers posted 2,112 unique jobs, and 5,424 hires were made. These two occupation groups do not require a postsecondary credential, however this program improves job opportunities and skill sets that employers desire.

There are 24 institutions in Tennessee which had completions from this program in 2015. These institutions awarded a total of 570 welding certificates in 2015.

TCAT-Knoxville (57)	TCAT-Jackson (42)	TCAT-Pulaski (35)	TCAT-Newbern (31)
TCAT-Nashville (29)	Miller-Motte Technical College-Madison (28)	TCAT-Covington (26)	TCAT-Harriman (26)
TCAT-Morristown (24)	TCAT-Dickson (23)	TCAT-McKenzie (22)	TCAT-Crump (22)
William Moore College of Technology (21)	TCAT-Jacksboro (21)	TCAT-Oneida-Huntsville (19)	TCAT-Hartsville (19)
TCAT-Memphis (18)	TCAT-Shelbyville (17)	TCAT-Elizabethton (17)	TCAT-McMinnville (17)
Northeast State Community College (15)	TCAT-Crossville (14)	TCAT-Whiteville (14)	TCAT-Athens (13)

INFORMATION TECHNOLOGY (IT) OCCUPATIONS

Information technology (IT) occupations are in high demand across Tennessee and the nation. Currently, 51,250 people are employed in computer (IT) occupations in the state. Tennessee's concentration of employment in these fields is 39 percent below the national average, however, there continues to be growth in employment. IT employment has increased 13.7 percent from 2010 to 2015. During 2015, there were 89,686 unique job postings for IT jobs in the state and 32,052 hires.

The table below outlines IT occupations which have high employer demand in one or more Tennessee regions. In the table, an "X" denotes high demand for an occupation in each individual region of Tennessee. There are several training programs jobseekers can access to obtain the necessary skill sets to work in IT. A few key programs are identified in the "Related Programs" column of the table below, but do not encompass all training programs available.⁹ The letters included in this column correspond to a postsecondary education program identified in the following pages.

IN-DEMAND IT OCCUPATIONS

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Related Programs ¹⁰
11-3021	Computer and Information Systems Managers				x						1	a, b, c
15-1121	Computer Systems Analysts		x	x	x	x	x			x	6	a, d
15-1131	Computer Programmers	x	x	x	x	x	x	x	x	x	9	b, c
15-1132	Software Developers, Applications	x		x	x	x		x	x	x	7	b, d, e
15-1133	Software Developers, Systems Software			x	x	x		x	x		5	b, d, e
15-1134	Web Developers	x			x	x					3	a, b, d, f, g
15-1141	Database Administrators				x	x					2	a, f
15-1142	Network and Computer Systems Administrators	x	x	x	x	x	x	x	x	x	9	a, f
15-1143	Computer Network Architects				x				x		2	a, b, d, f, g
15-1151	Computer User Support Specialists	x	x	x	x	x	x	x	x	x	9	b, f, g
15-1152	Computer Network Support Specialists							x			1	a, b, f, g
15-1199	Computer Occupations, All Other			x				x			2	b

KEY TRAINING PROGRAMS FOR IT

A. COMPUTER AND INFORMATION SCIENCES, GENERAL (CIP 11-0101)

This program prepares students for many different IT jobs, including *network and computer systems administrators* (15-1142), which have high employer demand in every region of Tennessee. During 2015 there were 10,827 unique job postings in Tennessee and 3700 hires for this position. Currently there are 5,781 network and computer system administrators employed in Tennessee, which is 27 percent below the national average concentration.

⁹This report identifies only a few key programs available to support the jobs which are in demand; not all available educational programs are highlighted. The programs were identified using Economic Modeling Specialists Intl. (EMSI), which has a crosswalk between occupations and programs.

¹⁰See corresponding programs in the following pages.

Computer systems analysts (SOC 15-1131) were identified as having high employer demand in six regions. This occupation is also supported by the Computer and Information Sciences degree. There are 3,869 computer systems analysts employed in Tennessee, which is 36 percent below the national average employment concentration. Median earnings for computer systems analysts are \$33.26 per hour, or \$69,180 per year. During 2015, Tennessee employers posted 4,519 unique jobs and made 2,592 hires.

The Computer and Information Sciences program supports additional jobs with high employer demand in some of Tennessee's regions: *Computer and information systems managers* (SOC 11-3021), *web developers* (SOC 15-1134), *database administrators* (SOC 15-1141) and *computer network architects* (SOC 15-1143).

There are 22 Tennessee institutions which had completions from this program in 2015. 465 students completed this program at Tennessee institutions in 2015. The majority of these completions (417) were degrees and 48 were certificates awarded from Pellissippi State Community College and TCAT-Shelbyville.

Austin Peay State University (81)	East Tennessee State University (73)	Pellissippi State Community College (81)	TCAT-Shelbyville (35)	Columbia State Community College (35)
Northeast State Community College (31)	Chattanooga State Community College (25)	Southwest Tennessee Community College (20)	Jackson State Community College (15)	Walters State Community College (14)
Lane College (12)	Milligan College (11)	Nashville State Community College (8)	Belmont University (6)	Freed-Hardeman University (6)
Tennessee Wesleyan College (3)	Maryville College (2)	Fisk University (2)	Carson-Newman University (2)	Lee University (1)
Motlow College (1)	Tennessee Temple University (1)			

B. COMPUTER SCIENCE (CIP 11-0701)

The computer science program prepares students for many different IT jobs, including nine jobs which are highlighted as in-demand in Tennessee.

The computer science program supports *computer programmers* (SOC 15-1131), which are in high demand in all nine regions of the state. During 2015, there were 4,519 unique job postings for computer programmers in Tennessee and 2,592 hires. Currently, there are 3,869 computer programmers employed in Tennessee. Employment grew 10.3 percent from 2010 to 2015. However, employment concentration for this occupation in Tennessee is 36 percent below the national average. Computer programmers have a median wage of \$33.26 per hour in Tennessee, or \$69,180 per year.

Computer science is a key program for eight other IT jobs with high employer demand: *Computer and information systems managers* (SOC 11-3021); *software developers, applications* (SOC 15-1132); *software developers, systems software* (SOC 15-1133); *web developers* (SOC 15-1134); *computer network architects* (SOC 15-1143); *computer user support specialists* (SOC 15-1151); *computer network support specialists* (SOC 15-1152); and *computer occupations, all other* (SOC 15-1199).

There are 16 Tennessee institutions which had students complete the computer science program in 2015. A total of 435 computer science degrees were awarded last year.

Middle Tennessee State University (74)	Vanderbilt University (70)	Tennessee Technological University (67)	University of Memphis (56)	University of Tennessee-Knoxville (51)
University of Tennessee-Chattanooga (42)	Tennessee State University (14)	Southern Adventist University (14)	University of Tennessee-Martin (12)	Christian Brothers University (10)
Rhodes College (9)	Sewanee-The University of the South (5)	Lipscomb University (4)	Union University (3)	Le Moyne-Owen College (2)
Bryan College-Dayton (2)				

C. MANAGEMENT INFORMATION SYSTEMS, GENERAL (CIP 52-1201)

This program prepares students to enter two of Tennessee's high-demand IT jobs. These include *computer and information systems managers* (SOC 11-3021), which are in demand in Northern Middle Tennessee where the occupation had 984 job openings in 2015, 186 postings per month and 152 hires per month.

The program also supports the *computer programmers* occupation (SOC 15-1131).

There are 12 Tennessee institutions which awarded certificates or degrees in this field of study in 2015. Tennessee students earned 35 certificates and 177 degrees in this program last year.

Middle Tennessee State University (76)	University of Memphis (43)	TCAT-Nashville (34)	University of Tennessee-Martin (23)	Bethel University (18)
DeVry University-Tennessee (6)	Belmont University (4)	Carson-Newman University (2)	Southern Adventist University (2)	Lipscomb University (1)
Lee University (1)				

D. INFORMATION TECHNOLOGY (CIP 11-0103)

The information technology program is a key postsecondary program supporting several IT job classifications which are in demand in Tennessee's regions: *Computer systems analysts* (SOC 15-1121); *software developers* (SOCs 15-1132 and 15-1133); *web developers* (SOC 15-1134); and *computer network architects* (SOC 15-1143).

There are 11 Tennessee institutions which awarded certificates and/or degrees for the information technology program in 2015. These institutions awarded a total of 42 certificates and 168 degrees in 2015.

King University (49)	Fountainhead College of Technology (38)	Middle Tennessee State University (38)	Pellissippi State Community College (23)	Trevecca Nazarene University (28)
Daymar Institute-Clarksville (13)	TCAT-Harriman (10)	TCAT-Crossville (9)	Lipscomb University (6)	Strayer University-Tennessee (4)
Union University (2)				

E. COMPUTER ENGINEERING, GENERAL (CIP 14-0901)

This program prepares students to work in software development fields, which are in demand in nearly every region of the state: *Software developers, applications* (SOC 15-1132) and *software developers, systems software* (SOC 15-1133). Currently, there are 10,529 software developers employed in Tennessee, with median earnings of \$39.84 per hour, or \$82,867 per year. Employment in these two occupations has increased 14.0 percent from 2010 to 2015; however employment concentration in Tennessee is 57 percent below the national average. During 2105, Tennessee employers posted 14,425 unique job postings for software developers and made 6,648 hires.

Only six Tennessee institutions had program completions in this field in 2015, awarding 41 bachelor's degrees, 11 master's degrees, and five doctor's degrees.

University of Tennessee-Knoxville (20)	Tennessee State University (11)	Tennessee Technological University (9)	University of Memphis (7)	Vanderbilt University (7)
Christian Brothers University (3)				

F. COMPUTER AND INFORMATION SYSTEMS SECURITY/INFORMATION ASSURANCE (CIP 11-1003)

This program prepares students for a variety of IT-related jobs, including six which are highlighted in our demand analysis for Tennessee's regions: *Web developers* (SOC 15-1134), *database administrators* (SOC 15-1141), *network and computer systems administrators* (SOC 15-1142), *computer network architects* (SOC 15-1143), *computer user support specialists* (SOC 15-1152), and *computer network support specialists* (SOC 1152).

There are 11 Tennessee institutions which awarded certificates or degrees for this program in 2015. The credential completions totaled 110 last year.

ITT Technical Institute-Nashville (23)	Nashville State Community College (22)	Fountainhead College of Technology (21)	ITT Technical Institute-Cordova (10)	University of Phoenix-Tennessee (8)
ITT Technical Institute-Knoxville (8)	ITT Technical Institute-Chattanooga (7)	Lipscomb University (5)	Vatterott College-Applying Farms (4)	National College-Nashville (1)
University of Memphis (1)				

G. SYSTEM, NETWORKING, AND LAN/WAN MANAGEMENT/MANAGER (CIP 11-1002)

Students who complete this Associate's degree program are prepared to find jobs in four of the in-demand IT jobs for Tennessee: *web developers* (SOC 15-1134), *computer network architects* (SOC 15-1143), *computer user support specialists* (SOC 15-1152) and *computer network support specialists* (SOC 1152).

There are five Tennessee institutions which awarded associate degrees for this program in 2015. A total of 138 students completed this program at a Tennessee institution in 2015.

ITT Technical Institute-Nashville (55)	ITT Technical Institute-Cordova (45)	ITT Technical Institute-Chattanooga (19)	ITT Technical Institute-Knoxville (15)	ITT Technical Institute-Johnson City (4)
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ENGINEERING AND ENGINEERING-RELATED OCCUPATIONS

Engineers, engineering technicians and other engineering-related occupations are in high demand across the state.

28,453 engineers are currently employed in the state of Tennessee. Tennessee's concentration of employment in engineering jobs is 16 percent below the national average; however, employment in engineering grew 14.1 percent from 2010 to 2015. There were about 2,720 unique engineering job postings in Tennessee for each month of 2015.

For each month of 2015, there were also 456 unique job postings for drafters, engineering technicians, and mapping technicians in Tennessee. There are 15,070 drafters, engineering technicians, and mapping technicians employed in Tennessee. The state's concentration of employment in these careers is above the national average and employment has continued to rise with 12.4 percent growth in the last five years.

The table below outlines engineering and related occupations which have high employer demand in one or more Tennessee regions. In the table, an "X" denotes high demand for an occupation in each individual region of Tennessee. There are several fields of study which prepare students for these jobs. A few key programs are identified in the last column of the table below, but do not encompass all training programs available.¹¹ The letters included in the table correspond to a key program for engineering identified in the following pages.

IN-DEMAND ENGINEERING AND RELATED OCCUPATIONS

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Related Programs ¹²
Engineers												
11-9041	Architectural and Engineering Managers		x		x	x	x		x		5	a, b, c, d
17-2051	Civil Engineers	x		x		x	x	x	x	x	7	d
17-2071	Electrical Engineers		x			x	x		x		4	c
17-2081	Environmental Engineers	x				x					2	
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	x									1	
17-2112	Industrial Engineers	x		x	x	x			x	x	6	b
17-2131	Materials Engineers	x									1	
17-2141	Mechanical Engineers		x	x	x	x	x		x		6	a
17-2199	Engineers, All Other			x	x		x		x	x	5	
Drafters, Engineering Technicians, and Mapping Technicians												
17-3011	Architectural and Civil Drafters					x			x		2	f
17-3013	Mechanical Drafters					x			x		2	

¹¹This report identifies only a few key programs available to support the jobs which are in demand; not all available educational programs are highlighted. The programs were identified using Economic Modeling Specialists Intl. (EMSI), which has a crosswalk between occupations and programs.

¹²See corresponding programs in the following pages.

17-3022	Civil Engineering Technicians	x									1	
17-3023	Electrical and Electronics Engineering Technicians				x	x	x		x		4	e
17-3025	Environmental Engineering Technicians				x						1	e
17-3026	Industrial Engineering Technicians	x	x	x	x	x	x		x	x	8	e, g
17-3029	Engineering Technicians, Except Drafters, All Other			x					x		2	e
17-3031	Surveying and Mapping Technicians								x		1	e

KEY TRAINING PROGRAMS FOR ENGINEERING

A. MECHANICAL ENGINEERING (CIP 14-1901)

Mechanical engineering is a critical program for *mechanical engineers* (SOC 17-2141), which are in demand across six of the state's nine regions. There are 4,136 mechanical engineers employed in Tennessee with a median wage of \$39.15 per hour, or \$81,432 per year. While this occupation has grown 7.0 percent in the five years from 2010 to 2015, concentration of mechanical engineers in Tennessee is 29 percent below the national average concentration. During 2015, Tennessee employers posted 3,804 unique mechanical engineering jobs, and 1,944 mechanical engineering hires were made.

There are nine Tennessee institutions which awarded certificates or degrees in this field of study in 2015. These institutions awarded 457 credentials in mechanical engineering during 2015. This included 400 bachelor's degrees, 42 master's degrees, and 10 doctor's degrees.

University of Tennessee-Knoxville (138)	Tennessee Technological University (130)	Vanderbilt University (85)	University of Tennessee-Chattanooga (36)	University of Memphis (20)
Christian Brothers University (17)	Lipscomb University (12)	Tennessee State University (11)	Union University (8)	

B. INDUSTRIAL ENGINEERING (CIP 14-3501)

The industrial engineering program prepares students for careers as *industrial engineers* (SOC 17-2112). Industrial engineers are in high demand across six of Tennessee's nine regions. There are 7,816 industrial engineers employed in Tennessee with a median wage of \$37.53 per hour, or \$78,062 per year. This occupation has grown 23.9 percent in the last five years and concentration of industrial engineers in Tennessee is 53 percent above the national average. During 2015, Tennessee employers posted 14,643 unique industrial engineering jobs, and 3,396 industrial engineering hires were made.

The University of Tennessee-Knoxville was the only institution in Tennessee which awarded industrial engineering degrees in 2015. There were 37 degrees awarded, which included 19 bachelor's degrees, 14 master's degrees and 4 doctor's degrees.

C. ELECTRICAL AND ELECTRONICS ENGINEERING (CIP 14-1001)

The electrical and electronics engineering program prepares students for careers as *electrical engineers* (SOC 17-2071), which are in demand across four of Tennessee's nine regions. There are 2,538 electrical engineers employed in Tennessee with a median wage of \$40.36 per hour, or \$83,949 per year. While this occupation has grown by 12.4 percent in the last five years from 2010 to 2015, the concentration of electrical engineers in Tennessee is 30 percent below the national average concentration. During 2015, Tennessee employers posted 3,448 unique electrical engineering jobs, and 1,348 electrical engineering hires were made.

There are nine Tennessee institutions which awarded degrees in this field of study during 2015. There were 262 degrees awarded last year, which included 190 bachelor's degrees, 48 master's degrees and 24 doctor's degrees.

University of Tennessee-Knoxville (71)	Tennessee Technological University (55)	Vanderbilt University (53)	University of Memphis (27)	University of Tennessee-Chattanooga (26)
Christian Brothers University (12)	Tennessee State University (12)	Union University (4)	Lipscomb University (3)	

D. CIVIL ENGINEERING, GENERAL (CIP 14-0801)

This program prepares students for careers as *civil engineers* (SOC 17-2051), which are in demand across seven of Tennessee's nine regions. There are 5,007 civil engineers employed in Tennessee with a median wage of \$41.11 per hour, or \$85,518 per year. While this occupation has grown by 18.1 percent in the last five years from 2010 to 2015, the concentration of civil engineers in Tennessee is 11 percent below the national average concentration. During 2015, Tennessee employers posted 2,849 unique civil engineering jobs, and 3,738 civil engineering hires were made.

There are eight Tennessee institutions which awarded degrees in this field of study during 2015. There were 264 degrees awarded last year, which included 195 bachelor's degrees, 54 master's degrees and 15 doctor's degrees.

University of Tennessee-Knoxville (106)	Tennessee Technological University (64)	Vanderbilt University (37)	University of Memphis (19)	University of Tennessee-Chattanooga (13)
Christian Brothers University (9)	Tennessee State University (9)	Lipscomb University (7)		

E. Engineering Technology, General (CIP 15.0000)

The engineering technology program provides training for several engineering-related jobs. This includes five jobs which were identified as in-demand in Tennessee's regions: *Electrical and electronics engineering technicians* (SOC 17-3023), *industrial engineering technicians* (SOC 17-3026), *environmental engineering technicians* (SOC 17-3025), *other engineering technicians* (SOC 17-3029) and *surveying and mapping technicians* (SOC 17-3031). These occupations employ 8,393 people in Tennessee, with a median wage of \$23.06 per hour, or \$47,964 per year. Jobs in these fields have grown by 14.6 percent in the last five years from 2010 to 2015, and concentration of these jobs in Tennessee is 19 percent above the national average.

There are eight Tennessee institutions which awarded credentials in this field of study during 2015. There were 523 credentials awarded last year, which included 118 certificates, 174 associate degrees, 220 bachelor's degrees and 11 master's degrees.

Pellissippi State Community College (173)	Chattanooga State Community College (86)	Middle Tennessee State University (67)	Tennessee Technological University (53)	East Tennessee State University (50)
Austin Peay State University (48)	University of Memphis (34)	Nashville State Community College (12)		

F. Drafting and Design Technology/Technician, General (CIP 15.1301)

This program prepares students for jobs as *architectural and civil drafters* (SOC 17-3011) and other drafters occupations. There are 1,453 architectural and civil drafters employed in Tennessee, with a median wage of \$23.87 per hour, or \$49,646 per year. The concentration of this occupation in Tennessee is 25 percent below the national average. During 2015, Tennessee employers posted 324 unique architectural and civil drafters jobs, and 1,170 architectural and civil drafters were hired.

During 2015, Tennessee institutions awarded 144 certificates and degrees in this program. There were 18 Tennessee institutions which awarded these credentials, which included 97 certificates and 47 associate degrees.

TCAT-Shelbyville (15)	ITT Technical Institute-Chattanooga (14)	Chattanooga State Community College (13)	ITT Technical Institute-Knoxville (11)	ITT Technical Institute-Nashville (10)
Nashville State Community College (9)	TCAT-Morristown (9)	TCAT-Murfreesboro (8)	ITT Technical Institute-Cordova (8)	TCAT-Crump (7)
TCAT-Newbern (7)	TCAT-Memphis (7)	TCAT-Nashville (6)	TCAT-Jackson (6)	TCAT-Crossville (5)
ITT Technical Institute-Johnson City (4)	TCAT-Hohenwald (4)	TCAT-Hartsville (1)		

G. INDUSTRIAL TECHNOLOGY/TECHNICIAN (CIP 15.0612)

This program provides training for the *industrial engineering technicians* occupation (SOC 17-3026), identified as in-demand in eight regions of Tennessee. There are 2,491 industrial engineering technicians employed in Tennessee with a median wage of \$21.49 per hour, or \$44,699 per year. This occupation has grown by 24.9 percent in the last five years from 2010 to 2015, and concentration of industrial engineering technicians in Tennessee is 97 percent above the national average. During 2015, Tennessee employers posted 1,811 unique industrial engineering technician jobs, and 934 industrial engineering technician hires were made.

There are seven Tennessee institutions which awarded 129 credentials in this field of study during 2015. This included 27 certificates, 97 associate degrees and five master's degrees.

Northeast State Community College (61)	Cleveland State Community College (18)	Walters State Community College (24)	Pellissippi State Community College (13)	Chattanooga State Community College (5)
Middle Tennessee State University (5)	Jackson State Community College (3)			

HEALTHCARE OCCUPATIONS

Healthcare and healthcare-support occupations are in high demand across the state of Tennessee.

The healthcare practitioners and technical occupations employ 192,446 jobs in Tennessee. Tennessee's concentration of employment in these jobs is 13 percent above the national average. The jobs in this occupational group are STEM and STEM-related jobs with high wages. There were 11,340 unique job postings for these occupations each month during 2015.

The healthcare-support occupations employ 83,006 in Tennessee. There were about 2,000 unique job postings for these occupations each month during 2015.

The table below outlines healthcare occupations which have high employer demand in one or more Tennessee regions. In the table, an "X" denotes high demand for an occupation in each individual region of Tennessee. A few key programs which prepare students for work in these fields are noted in the last column of the table below, but do not encompass all training programs available.¹³ The letters in the "Related Programs" column correspond to a key program for healthcare identified in the following pages.

IN-DEMAND HEALTHCARE OCCUPATIONS

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Related Programs ¹⁴
Healthcare Practitioners and Technical Occupations												
29-1051	Pharmacists				x		x			x	3	a, b
29-1062	Family and General Practitioners				x						1	c
29-1071	Physician Assistants									x	1	a
29-1122	Occupational Therapists	x		x	x	x			x	x	6	a, d
29-1123	Physical Therapists	x	x	x	x	x	x	x	x	x	9	a, e
29-1126	Respiratory Therapists		x	x	x					x	4	a, f
29-1127	Speech-Language Pathologists				x						1	a
29-1131	Veterinarians	x	x	x	x				x		5	a, g
29-1171	Nurse Practitioners			x	x	x					3	c, h
29-2011	Medical and Clinical Laboratory Technologists		x		x	x					3	a, i
29-2012	Medical and Clinical Laboratory Technicians		x		x		x		x	x	5	a, j
29-2032	Diagnostic Medical Sonographers		x		x					x	3	a, k
29-2034	Radiologic Technologists		x		x						2	a
29-2041	Emergency Medical Technicians and Paramedics		x	x					x		3	a, l
29-2052	Pharmacy Technicians		x	x			x			x	4	a, m
29-2055	Surgical Technologists				x						1	a
29-2056	Veterinary Technologists and Technicians					x				x	2	a
29-2061	Licensed Practical and Licensed Vocational Nurses	x	x	x	x	x	x	x	x	x	9	a, o

¹³This report identifies only a few key programs available to support the jobs which are in demand; not all available educational programs are highlighted. The programs were identified using Economic Modeling Specialists Intl. (EMSI), which has a crosswalk between occupations and programs.

¹⁴See corresponding programs in the following pages.

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Related Programs ¹⁴
29-2071	Medical Records and Health Information Technicians				x			x		x	3	a, n
29-2081	Opticians, Dispensing	x					x				2	a
Healthcare-Support Occupations												
31-2011	Occupational Therapy Assistants		x						x		2	a
31-2021	Physical Therapist Assistants	x	x	x	x	x	x	x	x	x	9	a, p
31-9011	Massage Therapists	x			x				x		3	a
31-9092	Medical Assistants				x						1	a, n, q
31-9094	Medical Transcriptionists					x					1	a
31-9096	Veterinary Assistants and Laboratory Animal Caretakers									x	1	a
31-9097	Phlebotomists									x	1	

KEY TRAINING PROGRAMS FOR HEALTHCARE

A. HEALTH SERVICES/ALLIED HEALTH/HEALTH SCIENCES, GENERAL (CIP 51-0000)

CERT has identified 27 healthcare-related jobs which are in high demand in one or more Tennessee regions. This program is relevant to 24 of the 27 jobs identified.

There are 10 Tennessee institutions which awarded certificates or degrees in this program during 2015. A total of 834 credentials were awarded, which included 771 certificates, 28 bachelor's degrees and 35 master's degrees.

Pellissippi State Community College (457)	Walters State Community College (179)	Jackson State Community College (64)	Columbia State Community College (43)	Meharry Medical College (35)
Lee University (22)	Cleveland State Community College (20)	Dyersburg State Community College (8)	South College (4)	Milligan College (2)

B. PHARMACY (51-2001)

The pharmacy program is a critical requirement for *pharmacists* (SOC 29-1051), which are in high demand in three of Tennessee's nine regions. During 2015, there were 8,621 pharmacist job postings in Tennessee and 4,020 hires. Currently, there are 8131 pharmacists employed in Tennessee. Median earnings for pharmacists in Tennessee are \$57.88 per hour, or \$120,390 per year.

Six Tennessee institutions awarded 549 doctor's degrees for Pharmacy in 2015.

University of Tennessee-Health Science Center (176)	South College (97)	Lipscomb University (79)	East Tennessee State University (76)	Belmont University (70)
Union University (51)				

C. FAMILY PRACTICE NURSE/NURSING (CIP 51-3805)

This program provides training for several occupations, including *nurse practitioners* (SOC 29-1171) and *family and general practitioners* (SOC 29-1062).

Family and general practitioners were identified as in-demand in Northern Middle Tennessee, where there were 309 openings in 2015, 1,680 unique job postings and 408 hires. Currently, there are 981 family and general practitioners in the region.

There are 12 institutions in Tennessee which awarded 292 certificates and degrees in 2015.

Vanderbilt University (65)	University of Tennessee-Health Science Center (60)	Southern Adventist University (59)	Union University (45)	Carson-Newman University (16)
University of Tennessee-Chattanooga (12)	East Tennessee State University (17)	Middle Tennessee State University (5)	Austin Peay State University (5)	University of Memphis (4)
Tennessee State University (3)	University of Tennessee-Knoxville (1)			

D. OCCUPATIONAL THERAPY/THERAPIST (CIP 51-2306)

This program prepares students for careers as *occupational therapists* (SOC 29-1122), which are in demand in six of Tennessee's nine regions. There are 1,947 occupational therapists employed in Tennessee with median earnings of \$37.09 per hour, or \$77,147 per year. Tennessee employment in this occupation is 21 percent below the national average. During 2015, employers posted 8,190 unique job openings in this occupation and made 1,068 hires.

There are five Tennessee institutions which awarded 148 degrees for occupational therapy during 2015. This included 2 associate degrees, 113 master's degrees and 33 doctor's degrees.

Belmont University (64)	Milligan College (29)	University of Tennessee-Health Science Center (28)	Tennessee State University (25)	Southern Adventist University (2)
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E. PHYSICAL THERAPY/THERAPIST (51-2308)

Employers have a high demand for *physical therapists* (SOC 29-1123) in every region of Tennessee. Currently, there are 4,555 physical therapists employed in Tennessee, earning median wages of \$41.08 per hour, or \$85,446 per year. During 2015, there were 12,336 unique postings for physical therapists in Tennessee and 2,436 hires.

Six Tennessee institutions awarded certificates or degrees in this program during 2015. The number of degrees awarded by these institutions in 2015 totaled 235, which included 14 associate degrees, 24 bachelor's degrees and 197 doctor's degrees.

University of Tennessee-Chattanooga (60)	University of Tennessee-Health Science Center (57)	East Tennessee State University (36)	Tennessee State University (35)	Belmont University (33)
Southern Adventist University (14)				

F. RESPIRATORY CARE THERAPY/THERAPIST (CIP 51-0908)

This program prepares students for careers as *respiratory therapists* (SOC 29-1126), which is in demand in four of Tennessee's nine regions. There are 3,520 respiratory therapists in Tennessee, which have median earnings of \$23.35 per hour, or \$48,568 per year. The concentration of respiratory therapists in Tennessee is 37 percent above the national average. During 2015, there were 2,040 unique job postings for this position, which is very high relative to the current level of employment in this field, and 1,176 hires.

There are eight Tennessee institutions which awarded 137 degrees for respiratory therapy during 2015. This included 107 associate degrees and 30 bachelor's degrees.

Concorde Career College-Memphis (35)	Chattanooga State Community College (22)	Tennessee State University (21)	Columbia State Community College (19)	Volunteer State Community College (11)
Walters State Community College (11)	Baptist Memorial College of Health Sciences (9)	Roane State Community College (9)		

G. VETERINARY MEDICINE (CIP 51-2401)

This program prepares students for careers as *veterinarians* (SOC 29-1131). There are 1,374 veterinarians employed in the state of Tennessee, earning median wages of \$37.94 per hour, or \$78,915 per year. Employment in this occupation has grown 17.8 percent from 2010 to 2015, however Tennessee's concentration of veterinarians is 4 percent below the national average. During 2015, there were 1,035 unique veterinarian job postings in Tennessee and 1,826 hires were made. Both of these activities are very high relative to the current number of veterinarians employed in the state.

The University of Tennessee-Knoxville is the only Tennessee institution which awards veterinary degrees. During 2015, UT-Knoxville awarded 91 doctor's degrees for veterinary medicine.

H. ADULT HEALTH NURSE/NURSING (CIP 51-3803)

This program prepares students for careers as registered nurses and *nurse practitioners* (SOC 29-1171). Nurse practitioners are in demand in three of Tennessee's nine regions. Currently, there are 4,783 nurse practitioners in Tennessee with median earnings of \$44.80 per hour, or \$93,184 per year. Tennessee's concentration of employment in this job is 63 percent above the national average, and Tennessee employment grew 17.8 percent from 2010 to 2015. During 2015, there were 3,583 unique job postings for nurse practitioners in the state and 1,860 hires.

There are three institutions in the state which awarded adult health nurse/nursing degrees in 2015. These three institutions awarded 319 bachelor's degrees and 45 master's degrees last year.

King University (319)	Vanderbilt University (40)	Southern Adventist University (5)		
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I. CLINICAL LABORATORY SCIENCE/MEDICAL TECHNOLOGY/TECHNOLOGIST (CIP 51-1005)

This program provides training for *medical and clinical laboratory technologists* (SOC 29-2011), which was identified as having high employer demand in three of Tennessee's nine regions. There are 4,258 medical and clinical laboratory technologists employed in Tennessee today with median earnings of \$28.53 per hour. During 2015, there were 3,630 unique postings for this occupation in Tennessee and 1,284 hires.

During 2015, six Tennessee institutions awarded 65 bachelor's degrees in this field of study.

Austin Peay State University (34)	Lincoln Memorial University (13)	University of Tennessee-Health Science Center (10)	Baptist Memorial College of Health Sciences (6)	Southern Adventist University (1)
Trevecca Nazarene University (1)				

J. CLINICAL/MEDICAL LABORATORY TECHNICIAN (51-1004)

Employers have a high demand for *medical and clinical laboratory technicians* (29-2012) in five Tennessee regions. There were 6,945 medical and clinical laboratory technicians employed in Tennessee in 2015, with median wages of \$17.30 per hour, or \$35,984 per year. This occupation has grown 20.2 percent in the last five years, and concentration of this job in the state is 108 percent above the national average. Across the state of Tennessee, there were 2,566 unique postings for this occupation during 2015 and 2,796 hires.

There are five Tennessee institutions which awarded 57 associate degrees in this field of study during 2015.

Fortis Institute- Cookeville (21)	Southwest Tennessee Community College (13)	Jackson State Community College (11)	Volunteer State Community College (9)	Fortis Institute- Nashville (3)
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K. DIAGNOSTIC MEDICAL SONOGRAPHY/SONOGRAPHER AND ULTRASOUND TECHNICIAN (CIP 51-0910)

This program prepares students for careers as diagnostic medical sonographers (SOC 29-2032), which have high employer demand in three regions of Tennessee. During 2015, there were 1,422 unique postings for this job and 504 hires in the state of Tennessee. There are 1,691 people employed in this occupation in the state, with median earnings of \$28.90 per hour, or \$60,112 per year.

During 2015, three Tennessee institutions awarded certificates and degrees in this field of study.

Volunteer State Community College (12)	Baptist Memorial College of Health Sciences (9)	South College (8)		
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L. EMERGENCY MEDICAL TECHNOLOGY/TECHNICIAN (EMT PARAMEDIC) (CIP 51-0904)

This program prepares students to become *emergency medical technicians and paramedics* (SOC 29-2041), which is in demand in three Tennessee regions. In 2015, there were 2,968 unique job postings for this occupation in Tennessee and 2,724 hires. There are 6,772 EMTs and paramedics employed in the state of Tennessee; this employment concentration is 36 percent above the national average.

In 2015, 11 institutions in Tennessee awarded 834 certificates and degrees in this field. The large majority of these credentials were certificates (819) and 15 were associate degrees.

Volunteer State Community College (181)	Columbia State Community College (115)	Southwest Tennessee Community College (102)	Walters State Community College (87)	Chattanooga State Community College (83)
Roane State Community College (68)	Jackson State Community College (66)	Cleveland State Community College (64)	Northeast State Community College (36)	Dyersburg State Community College (34)
Motlow College (15)				

M. PHARMACY TECHNICIAN/ASSISTANT (CIP 51-0805)

This program provides training for *pharmacy technicians* (SOC 29-2052), which have high employer demand in four regions of the state.

There are 21 institutions in Tennessee which awarded 354 certificates and 34 associate degrees in 2015.

Concorde Career College-Memphis (97)	Chattanooga State Community College (29)	Remington College- Memphis (28)	TCAT-Memphis (22)	Fortis Institute- Cookeville (20)
National College- Nashville (27)	TCAT-Athens (19)	TCAT-Livingston (17)	Walters State Community College (17)	Virginia College- School of Business and Health- Chattanooga (16)
Southwest Tennessee Community College (16)	Virginia College- Knoxville (14)	Genesis Career College-Cookeville (14)	TCAT—Murfreesboro (9)	Fortis Institute- Nashville (8)
Roane State Community College (8)	Ross Medical Education Center- Johnson City (6)	Nashville College of Medical Careers (6)	Daymar Institute- Murfreesboro (5)	Daymar Institute- Nashville (6)
Daymar Institute- Clarksville (4)				

N. MEDICAL INSURANCE CODING SPECIALIST/CODER (CIP 51-0713)

This program of study prepares students for employment as *medical records and health information technicians* (SOC 29-2071), which have high employer demand in three regions of the state. During 2015, there were 7,985 unique job postings for this occupation in Tennessee and 2,712 hires. There are 5,724 medical records and health information technicians employed in Tennessee. This concentration of

employment is 39 percent above the national average for this occupation.

The program also prepares students for the medical assistants (SOC 31-9092) occupation.

In 2015, 13 Tennessee institutions awarded 269 certificates and associate degrees in this field of study.

Brightwood College-Nashville (55)	Remington College-Memphis (43)	Pellissippi State Community College (30)	Nashville College of Medical Careers (25)	Virginia College-School of Business and Health-Chattanooga (32)
Miller-Motte Technical College-Chattanooga (18)	Virginia College-Knoxville (21)	Daymar Institute-Clarksville (23)	Daymar Institute-Murfreesboro (8)	Daymar Institute-Nashville (5)
Walters State Community College (5)	West Tennessee Business College (3)	Remington College-Nashville (1)		

O. LICENSED PRACTICAL/VOCATIONAL NURSE TRAINING (CIP 51-3901)

This program provides training for *licensed practical and licensed vocational nurses* (SOC 29-2061), which are in high demand in every region of Tennessee. There are 23,088 licensed practical and licensed vocational nurses in Tennessee with median earnings of \$17.82 per hour, or \$37,065 per year. Employment in this field has increased 9.3 percent from 2010 to 2015, and Tennessee's concentration of employment in this field is 55 percent above the national average. During 2015, there were 13,056 unique job postings, and 15,564 hires for this job.

During 2015, there were 24 TACTs which awarded 1,290 certificates in this program of study.

TCAT-Elizabethton (131)	TCAT-Nashville (103)	TCAT-Knoxville (102)	TCAT-Dickson (95)	TCAT-Jackson (78)
TCAT-Paris (72)	TCAT-Livingston (61)	TCAT-Hohenwald (58)	TCAT-Covington (56)	TCAT-Memphis (49)
TCAT-Hartsville (49)	TCAT-Morristown (48)	TCAT-Murfreesboro (46)	TCAT-Harriman (40)	TCAT-Oneida-Huntsville (40)
TCAT-McMinnville (39)	TCAT-Athens (34)	TCAT-Crossville (32)	TCAT Ripley (32)	TCAT-Shelbyville (31)
TCAT-Newbern (28)	TCAT-Whiteville (25)	TCAT-Jacksboro (24)	TCAT-Crump (17)	

P. PHYSICAL THERAPY TECHNICIAN/ASSISTANT (51-0806)

Employers also have a high demand for *physical therapy assistants* (SOC 31-2021) in every region of Tennessee. During 2015, there were 3,071 unique job postings for physical therapy assistants and 1,512 hires. Currently, there are 2,750 physical therapists employed in Tennessee with median earnings of \$27.08 per hour. Physical therapist employment concentration in Tennessee is 57 percent above the national average.

There are nine institutions in Tennessee which awarded 197 associate degrees for this program in 2015.

Volunteer State Community College (29)	Daymar Institute-Clarksville (23)	Chattanooga State Community College (22)	Concorde Career College-Memphis (22)	South College (22)
Jackson State Community College (21)	Walters State Community College (20)	Roane State Community College (19)	Southwest Tennessee Community College (19)	

Q. MEDICAL/CLINICAL ASSISTANT (CIP 51-0801)

The *medical assistants* (SOC 31-9092) occupation has high employer demand in Northern Middle Tennessee. There were 1,932 unique job postings for this occupation in Northern Middle Tennessee in 2015 and 2,172 hires.

In 2015, 24 Tennessee institutions awarded 1,337 certificates and degrees in this field of study.

Concorde Career College-Memphis (270)	Remington College-Memphis Campus (100)	Brightwood College-Nashville (97)	Ross Medical Education Center-Johnson City (88)	Virginia College-Knoxville (101)
Fortis Institute-Nashville (75)	Vatterott College-Applying Farms (66)	Nashville College of Medical Careers (62)	Fortis Institute-Cookeville (49)	West Tennessee Business College (47)
Virginia College-School of Business and Health-Chattanooga (48)	National College-Nashville (41)	Remington College-Nashville (36)	Miller-Motte Technical College-Chattanooga (40)	Miller-Motte Technical College-Clarksville (34)
Daymar Institute-Clarksville (46)	Miller-Motte Technical College-Madison (21)	Chattanooga College Medical Dental and Technical Careers (20)	Genesis Career College-Cookeville (19)	South College (18)
TCAT-Knoxville (16)	Daymar Institute-Murfreesboro (23)	Genesis Career College-Lebanon (11)	Daymar Institute-Nashville (9)	

APPENDIX A: OCCUPATIONS WITH HIGH EMPLOYER DEMAND

The table below outlines all occupations which have high employer demand in one or more Tennessee regions. In the table, an “X” denotes high demand for an occupation in each individual region of Tennessee.

STEM and STEM-related occupations are denoted by **blue** text.

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
Management (11-0000)											
11-1021	General and Operations Managers	x			x	x	x	x	x		6
11-2021	Marketing Managers				x	x				x	3
11-2022	Sales Managers	x	x		x			x		x	5
11-2031	Public Relations and Fundraising Managers	x				x					2
11-3021	Computer and Information Systems Managers				x						1
11-3031	Financial Managers				x						1
11-3051	Industrial Production Managers	x		x	x				x		4
11-3061	Purchasing Managers			x	x	x		x	x		5
11-3071	Transportation, Storage, and Distribution Managers		x		x			x	x		4
11-3121	Human Resources Managers				x	x		x	x	x	5
11-3131	Training and Development Managers				x	x		x			3
11-9013	Farmers, Ranchers, and Other Agricultural Managers		x								1
11-9021	Construction Managers	x	x		x	x			x	x	6
11-9031	Education Administrators, Preschool and Childcare Center/Program					x				x	2
11-9033	Education Administrators, Postsecondary	x	x			x			x	x	5
11-9039	Education Administrators, All Other	x									1
11-9041	Architectural and Engineering Managers		x		x	x	x		x		5
11-9051	Food Service Managers	x	x	x	x	x	x	x	x	x	9
11-9081	Lodging Managers	x	x								2
11-9111	Medical and Health Services Managers				x						1
11-9121	Natural Sciences Managers							x			1
11-9141	Property, Real Estate, and Community Association Managers	x	x	x	x			x		x	6
11-9151	Social and Community Service Managers	x	x	x	x	x	x	x	x	x	9
11-9199	Managers, All Other									x	1
Business and Financial Operations (13-0000)											
13-1011	Agents and Business Managers of Artists, Performers, and Athletes				x						1
13-1022	Wholesale and Retail Buyers, Except Farm Products	x			x			x			3
13-1051	Cost Estimators	x			x	x			x		4
13-1071	Human Resources Specialists	x	x	x	x	x	x	x	x	x	9

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
13-1111	Management Analysts		x		x	x		x			4
13-1121	Meeting, Convention, and Event Planners				x	x					2
13-1131	Fundraisers							x			1
13-1141	Compensation, Benefits, and Job Analysis Specialists					x					1
13-1151	Training and Development Specialists	x	x	x	x	x		x	x		7
13-1161	Market Research Analysts and Marketing Specialists	x	x		x	x	x	x			6
13-2011	Accountants and Auditors	x	x	x	x	x	x	x	x	x	9
13-2041	Credit Analysts				x						1
13-2051	Financial Analysts		x	x	x						3
13-2052	Personal Financial Advisors	x			x				x		3
13-2082	Tax Preparers				x	x		x	x	x	5
Computer and Mathematical (15-0000)											
15-1121	Computer Systems Analysts		x	x	x	x	x			x	6
15-1131	Computer Programmers	x	x	x	x	x	x	x	x	x	9
15-1132	Software Developers, Applications	x		x	x	x		x	x	x	7
15-1133	Software Developers, Systems Software			x	x	x		x	x		5
15-1134	Web Developers	x			x	x					3
15-1141	Database Administrators				x	x					2
15-1142	Network and Computer Systems Administrators	x	x	x	x	x	x	x	x	x	9
15-1143	Computer Network Architects				x				x		2
15-1151	Computer User Support Specialists	x	x	x	x	x	x	x	x	x	9
15-1152	Computer Network Support Specialists							x			1
15-1199	Computer Occupations, All Other			x				x			2
15-2031	Operations Research Analysts				x	x					2
Architecture and Engineering (17-0000)											
17-1011	Architects, Except Landscape and Naval				x						1
17-2051	Civil Engineers	x		x		x	x	x	x	x	7
17-2071	Electrical Engineers		x			x	x		x		4
17-2081	Environmental Engineers	x				x					2
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	x									1
17-2112	Industrial Engineers	x		x	x	x			x	x	6
17-2131	Materials Engineers	x									1
17-2141	Mechanical Engineers		x	x	x	x	x		x		6
17-2199	Engineers, All Other			x	x		x		x	x	5
17-3011	Architectural and Civil Drafters					x			x		2
17-3013	Mechanical Drafters					x			x		2
17-3022	Civil Engineering Technicians	x									1

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
17-3023	Electrical and Electronics Engineering Technicians				x	x	x		x		4
17-3025	Environmental Engineering Technicians				x						1
17-3026	Industrial Engineering Technicians	x	x	x	x	x	x		x	x	8
17-3029	Engineering Technicians, Except Drafters, All Other			x					x		2
17-3031	Surveying and Mapping Technicians								x		1
Life, Physical, and Social Science (19-0000)											
19-1042	Medical Scientists, Except Epidemiologists				x	x					2
19-2031	Chemists					x					1
19-2041	Environmental Scientists and Specialists, Including Health	x									1
19-3031	Clinical, Counseling, and School Psychologists			x							1
19-4031	Chemical Technicians	x	x	x	x	x					5
19-4091	Environmental Science and Protection Technicians, Including Health	x									1
19-4099	Life, Physical, and Social Science Technicians, All Other	x			x			x			3
Community and Social Service (21-0000)											
21-1011	Substance Abuse and Behavioral Disorder Counselors		x	x		x					3
21-1014	Mental Health Counselors	x	x	x	x		x	x		x	7
21-1021	Child, Family, and School Social Workers	x	x	x		x	x				5
21-1022	Healthcare Social Workers		x	x		x	x			x	5
21-1023	Mental Health and Substance Abuse Social Workers	x	x	x			x	x	x	x	7
21-1093	Social and Human Service Assistants		x				x			x	3
21-1099	Community and Social Service Specialists, All Other	x									1
21-2011	Clergy									x	1
21-2021	Directors, Religious Activities and Education					x				x	2
Education, Training, and Library (25-0000)											
25-2011	Preschool Teachers, Except Special Education									x	1
25-2032	Career/Technical Education Teachers, Secondary School						x				1
25-3021	Self-Enrichment Education Teachers									x	1
25-3099	Teachers and Instructors, All Other		x	x		x		x			4
Arts, Design, Entertainment, Sports, and Media (27-0000)											
27-1024	Graphic Designers	x	x		x		x	x			5

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
27-1026	Merchandise Displayers and Window Trimmers				x			x	x		3
27-2011	Actors				x						1
27-2012	Producers and Directors	x			x						2
27-2022	Coaches and Scouts		x			x		x			3
27-2042	Musicians and Singers					x		x		x	3
27-3031	Public Relations Specialists	x	x	x	x		x	x			6
27-3041	Editors			x							1
27-4011	Audio and Video Equipment Technicians								x		1
27-4021	Photographers								x		1
Healthcare Practitioners and Technical (29-0000)											
29-1051	Pharmacists				x		x			x	3
29-1062	Family and General Practitioners				x						1
29-1071	Physician Assistants									x	1
29-1122	Occupational Therapists	x		x	x	x			x	x	6
29-1123	Physical Therapists	x	x	x	x	x	x	x	x	x	9
29-1126	Respiratory Therapists		x	x	x					x	4
29-1127	Speech-Language Pathologists				x						1
29-1131	Veterinarians	x	x	x	x				x		5
29-1171	Nurse Practitioners			x	x	x					3
29-2011	Medical and Clinical Laboratory Technologists		x		x	x					3
29-2012	Medical and Clinical Laboratory Technicians		x		x		x		x	x	5
29-2032	Diagnostic Medical Sonographers		x		x					x	3
29-2034	Radiologic Technologists		x		x						2
29-2041	Emergency Medical Technicians and Paramedics		x	x					x		3
29-2052	Pharmacy Technicians		x	x			x			x	4
29-2055	Surgical Technologists				x						1
29-2056	Veterinary Technologists and Technicians					x				x	2
29-2061	Licensed Practical and Licensed Vocational Nurses	x	x	x	x	x	x	x	x	x	9
29-2071	Medical Records and Health Information Technicians				x			x		x	3
29-2081	Opticians, Dispensing	x					x				2
Healthcare Support (31-0000)											
31-2011	Occupational Therapy Assistants		x						x		2
31-2021	Physical Therapist Assistants	x	x	x	x	x	x	x	x	x	9
31-9011	Massage Therapists	x			x				x		3
31-9092	Medical Assistants				x						1
31-9094	Medical Transcriptionists					x					1

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
31-9096	Veterinary Assistants and Laboratory Animal Caretakers									x	1
31-9097	Phlebotomists									x	1
Protective Service (33-0000)											
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers							x			1
33-1099	First-Line Supervisors of Protective Service Workers, All Other					x					1
33-3021	Detectives and Criminal Investigators		x				x			x	3
33-3051	Police and Sheriff's Patrol Officers	x	x	x			x	x		x	6
33-9021	Private Detectives and Investigators	x									1
33-9032	Security Guards		x	x							2
33-9099	Protective Service Workers, All Other	x						x			2
Food Preparation and Serving Related (35-0000)											
35-1011	Chefs and Head Cooks		x		x		x	x		x	5
Building and Grounds Cleaning and Maintenance (37-0000)											
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	x	x				x	x	x	x	6
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	x				x		x	x		4
37-2021	Pest Control Workers	x	x	x			x		x	x	6
37-3013	Tree Trimmers and Pruners		x			x	x			x	4
37-3019	Grounds Maintenance Workers, All Other					x					1
Personal Care and Service (39-0000)											
39-1021	First-Line Supervisors of Personal Service Workers	x	x	x	x		x	x	x	x	8
39-9031	Fitness Trainers and Aerobics Instructors	x		x		x			x		4
Sales and Related (41-0000)											
41-1011	First-Line Supervisors of Retail Sales Workers	x	x	x	x	x	x	x	x	x	9
41-1012	First-Line Supervisors of Non-Retail Sales Workers			x	x			x			3
41-2022	Parts Salespersons						x	x	x	x	4
41-3011	Advertising Sales Agents	x		x	x	x					4
41-3021	Insurance Sales Agents	x	x	x	x	x		x	x	x	8
41-3031	Securities, Commodities, and Financial Services Sales Agents				x						1
41-3099	Sales Representatives, Services, All Other	x	x	x	x	x	x	x	x	x	9
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products			x	x		x			x	4

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products		x	x						x	3
41-9011	Demonstrators and Product Promoters				x						1
41-9022	Real Estate Sales Agents	x			x				x		3
41-9031	Sales Engineers				x						1
41-9099	Sales and Related Workers, All Other	x	x	x			x	x		x	6
Office and Administrative Support (43-0000)											
43-1011	First-Line Supervisors of Office and Administrative Support Workers	x		x				x	x	x	5
43-3011	Bill and Account Collectors			x	x	x		x	x	x	6
43-3021	Billing and Posting Clerks				x						1
43-3031	Bookkeeping, Accounting, and Auditing Clerks				x	x			x		3
43-3051	Payroll and Timekeeping Clerks				x						1
43-4011	Brokerage Clerks				x						1
43-4051	Customer Service Representatives	x	x	x		x	x			x	6
43-4151	Order Clerks		x								1
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	x		x	x	x		x	x	x	7
43-5011	Cargo and Freight Agents					x					1
43-5021	Couriers and Messengers							x			1
43-5032	Dispatchers, Except Police, Fire, and Ambulance	x			x	x		x			4
43-5061	Production, Planning, and Expediting Clerks			x	x	x			x		4
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping				x				x		2
43-6011	Executive Secretaries and Executive Administrative Assistants	x			x	x		x	x		5
43-9011	Computer Operators							x			1
43-9041	Insurance Claims and Policy Processing Clerks		x					x		x	3
43-9199	Office and Administrative Support Workers, All Other	x		x			x	x	x	x	6
Farming, Fishing, and Forestry (45-0000)											
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers		x								1
45-2091	Agricultural Equipment Operators		x	x						x	3
45-4022	Logging Equipment Operators			x			x				2
Construction and Extraction (47-0000)											
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers		x	x	x	x					4
47-2021	Brickmasons and Blockmasons	x							x		2

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
47-2031	Carpenters						x		x		2
47-2051	Cement Masons and Concrete Finishers	x			x	x			x	x	5
47-2071	Paving, Surfacing, and Tamping Equipment Operators	x	x	x	x			x	x	x	7
47-2073	Operating Engineers and Other Construction Equipment Operators		x	x				x	x		4
47-2081	Drywall and Ceiling Tile Installers	x			x						2
47-2111	Electricians	x	x	x	x	x			x	x	7
47-2141	Painters, Construction and Maintenance	x	x	x	x	x	x	x	x	x	9
47-2151	Pipelayers	x						x			2
47-2152	Plumbers, Pipefitters, and Steamfitters	x	x		x						3
47-2181	Roofers	x		x	x			x	x	x	6
47-2211	Sheet Metal Workers	x		x	x			x	x	x	6
47-2221	Structural Iron and Steel Workers			x	x			x		x	4
47-3013	Helpers--Electricians							x			1
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters			x	x				x		3
47-4011	Construction and Building Inspectors	x				x					2
Installation, Maintenance and Repair (49-0000)											
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	x	x	x	x		x	x	x		7
49-2011	Computer, Automated Teller, and Office Machine Repairers				x		x				2
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers		x				x				2
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay									x	1
49-2098	Security and Fire Alarm Systems Installers	x			x	x	x		x		5
49-3011	Aircraft Mechanics and Service Technicians	x				x		x			3
49-3021	Automotive Body and Related Repairers	x	x	x	x	x			x	x	7
49-3023	Automotive Service Technicians and Mechanics	x	x	x	x	x	x	x	x	x	9
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	x	x	x	x		x	x	x		7
49-3041	Farm Equipment Mechanics and Service Technicians		x	x			x				3
49-3042	Mobile Heavy Equipment Mechanics, Except Engines		x		x		x	x	x	x	6
49-3093	Tire Repairers and Changers			x	x						2
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door						x				1
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	x	x	x	x		x				5

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
49-9041	Industrial Machinery Mechanics	x		x	x	x	x			x	6
49-9044	Millwrights	x				x	x	x			4
49-9051	Electrical Power-Line Installers and Repairers	x		x	x				x		4
49-9052	Telecommunications Line Installers and Repairers			x				x			2
49-9062	Medical Equipment Repairers				x						1
49-9071	Maintenance and Repair Workers, General	x	x	x	x	x		x	x	x	8
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers			x							1
49-9099	Installation, Maintenance, and Repair Workers, All Other			x				x		x	3
Production (51-0000)											
51-2022	Electrical and Electronic Equipment Assemblers	x		x	x		x		x	x	6
51-2041	Structural Metal Fabricators and Fitters			x							1
51-2092	Team Assemblers	x	x		x		x	x	x		6
51-2099	Assemblers and Fabricators, All Other			x				x			2
51-3021	Butchers and Meat Cutters	x						x			2
51-3092	Food Batchmakers		x	x		x		x			4
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	x	x		x			x	x		5
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic								x		1
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic								x		1
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic								x		1
51-4041	Machinists			x	x	x		x	x		5
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic								x		1
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic								x		1
51-4121	Welders, Cutters, Solderers, and Brazers			x	x	x	x	x	x		6
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders					x					1
51-5112	Printing Press Operators		x								1
51-6093	Upholsterers		x								1
51-7011	Cabinetmakers and Bench Carpenters			x							1
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood						x	x			2

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing				x						1
51-8031	Water and Wastewater Treatment Plant and System Operators							x			1
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers			x	x				x		3
51-9111	Packaging and Filling Machine Operators and Tenders	x	x	x				x		x	5
51-9151	Photographic Process Workers and Processing Machine Operators						x				1
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic			x							1
51-9198	Helpers--Production Workers			x							1
51-9199	Production Workers, All Other			x	x	x	x	x	x	x	7
Transportation and Material Moving (53-0000)											
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	x		x	x		x	x	x		6
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	x	x	x	x	x	x	x	x	x	9
53-3031	Driver/Sales Workers			x	x		x			x	4
53-3032	Heavy and Tractor-Trailer Truck Drivers	x	x	x	x	x	x	x	x	x	9
53-3033	Light Truck or Delivery Services Drivers		x	x	x					x	4
53-3099	Motor Vehicle Operators, All Other					x					1
53-4011	Locomotive Engineers		x								1
53-4031	Railroad Conductors and Yardmasters		x					x			2
53-5021	Captains, Mates, and Pilots of Water Vessels								x		1
53-7011	Conveyor Operators and Tenders		x								1
53-7021	Crane and Tower Operators						x		x		2
53-7032	Excavating and Loading Machine and Dragline Operators	x			x			x	x		4
53-7051	Industrial Truck and Tractor Operators	x		x			x	x			4
53-7061	Cleaners of Vehicles and Equipment			x							1
53-7081	Refuse and Recyclable Material Collectors		x								1



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