



2019-2020

# Academic Supply and Occupational Demand Report



# Tennessee Higher Education Commission

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# Table of Contents

Executive Summary.....	6
Introduction .....	7
Data and Methods .....	8
Expected Degrees.....	11
State Workforce Needs.....	15
Over Supplied Programs.....	20
Institutions Offering Programs in High-Demand Occupations .....	21
Limitations and Conclusions .....	37
Appendix A: Program of Study Clusters.....	39
Appendix B: Regional Workforce Demand.....	40
Appendix C: Wage Data by CIP Code and Degree Level.....	47

## List of Tables

Table 1: Top 25 High-Demand Occupations with the Greatest Number of Annual Openings.....	16
Table 2: Employment Rates for the Programs of Study and Award Levels for the Top 25 Occupations.....	19
Table 3: Programs of Study with the Largest Projected Surplus .....	20
Table A-1: Program of Study Clusters .....	39
Table B: Top 10 High-Demand Occupations with the Greatest Number of Annual Openings	
• 1- East .....	40
• 2- Greater Memphis.....	41
• 3- Northeast.....	41
• 4- Northwest .....	42
• 5- Northern Middle.....	42
• 6- Southern Middle.....	43
• 7- Southeast .....	44
• 8- Southwest.....	44
• 9- Upper Cumberland .....	45
Table C: Top 10 Income Earners by CIP Code	
• 1- Certificate .....	46
• 2- Associate .....	46
• 3- Bachelor's .....	47

## List of Figures

Figure 1: Total Degrees by Degree Level.....	11
Figure 2: Certificates by Sector .....	12
Figure 3: Associate Degrees by Sector .....	12
Figure 4: Bachelor's Degrees by Sector .....	13
Figure B-1: Map of Tennessee Regions.....	40

# Executive Summary

- Overall degree production is projected to continue increasing in the coming years.
  - Degree production at the certificate and associates level is projected to increase
  - Bachelor's degree production is projected to decrease slightly
- There is high demand for individuals trained in a variety of occupations across the state.
  - The occupations with the greatest number of projected annual openings include:
    - Heavy and Tractor-Trailer Truck Drivers
    - General and Operations Managers
    - Registered Nurses
    - First-Line Supervisors of Office and Administrative Support Workers
    - Elementary School Teachers, Except Special Education
  - Occupations with the greatest number of projected annual openings require all levels of education and training, from a high school diploma (or equivalent) through a graduate degree.
- Many higher education institutions in Tennessee offer academic programs that can meet the workforce needs of high-demand occupations.
  - Public, private, and proprietary institutions offer programs of all levels in majors related to these high-demand occupations.
  - Opportunities for postsecondary training in these occupations are available across the state and are not limited to specific geographic areas.
- Occupational demand varies slightly by region but is largely aligned with statewide workforce needs.
  - Variation at the regional level is often a matter of order. For example, while nearly every region has a demand for nurses, the level and significance of this need changes.
- Tennessee has a number of diploma, certificate, and associate's programs that provide pathways to high wages including:
  - Electrical, Electronic and Communications Engineering Technology
  - Diagnostic Medical Sonography/Sonographer and Ultrasound Tech
  - Truck and Bus Driver/Commercial Vehicle Operation
  - Computer and Information Systems Security
  - Engineering Technology, General

# Introduction

This report is prepared pursuant to Tennessee Code Annotated § 49-7-112(b), which directs the Tennessee Higher Education Commission (THEC) to “produce an annual report regarding state workforce need projections and credential production.”

This report is the result of a collaboration between THEC and the Tennessee Department of Labor and Workforce Development (TDLWD). Using data from academic years 2006 through 2016, THEC projected degree production for public, private, and proprietary<sup>1</sup> institutions in Tennessee through 2021 (i.e., academic supply). Separately, TDLWD projected the needs of Tennessee’s workforce (i.e., occupational demand) for 2016 through 2026 to determine which occupations will have the greatest number of annual openings. TDLWD then analyzed the credentials produced by Tennessee’s postsecondary institutions in the programs of study aligned with high-demand occupations to determine whether higher education is meeting the needs of employers.

## This report is divided into four sections:

- **Expected Degrees** presents projections of postsecondary credentials to be awarded by public, private, and proprietary institutions in Tennessee through 2021.
- **State Workforce Needs** identifies the top 25 high-demand occupations with the highest number of annual openings in Tennessee through 2026. This section also lists the most oversupplied programs of study in Tennessee, for which there are substantially more postsecondary graduates than job opportunities.
- **Institutions Offering Programs in High-Demand Occupations** lists the public, private, and proprietary institutions across Tennessee that offer programs in the 25 highest-demand occupations.
- **Limitations and Conclusions** describes the caveats in these analyses and summarizes the key takeaways of the report.

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<sup>1</sup> Proprietary institutions are also known as “for-profit” institutions.

# Data and Methods

Projections of degree production and workforce demand were developed independently by THEC and TDLWD, respectively. The sections below explain the methodology used to develop these projections and address important caveats for using these estimates.

## *Academic Supply Projections*

Postsecondary credentials are projected through academic year 2021, based on historical data for 2006 through 2016-17. The institutions included in these projections are public, private, and proprietary institutions in Tennessee that award postsecondary certificates, associate degrees, or bachelor's.<sup>2</sup> For public and proprietary institutions, THEC used historical data from its student information system, its Division of Postsecondary State Authorization, and the Integrated Postsecondary Education Data System (IPEDS).<sup>3</sup> For private institutions, THEC used historical data from the Tennessee Independent Colleges and Universities Association (TICUA) and IPEDS. Due to a lag in data publishing for IPEDS institutions, the full dataset of degree production in Tennessee is only available through 2016-17. The projections include certificates of less than two years in length, associate degrees, and bachelor's. THEC's projections are aggregated at the degree level; degree production is not disaggregated by major or concentration.

## *Occupational Demand Projections*

TDLWD projected occupational demand by Standard Occupation Classification (SOC) code. The Bureau of Labor Statistics provides information about the education and training required for specific occupations across the state. These education and training requirements reflect what is typically observed for an employee in a given occupation, though exceptions exist. Except where otherwise noted, any mention of "high-demand occupations" in this report refers to the 25 highest demand occupations with the greatest number of annual openings listed in **Table 1**.

One of the primary data sets used to identify workforce demand is Tennessee's long-term occupational projections (from 2016 to 2026), including expected annual total openings. The openings consist of those created by growth and by occupational separations. Additional criteria including real-time labor market information from Tennessee's jobs database were used to present a more comprehensive picture of occupations in demand and their characteristics.

The average annual occupational projections are then compared to the number of people being trained in Tennessee in related programs of study to see if shortages of workers in certain occupations are expected (**Table 2**). The relationship between education requirements and occupation is most direct for highly specialized fields, such as those requiring a specific certificate or an advanced degree. Conversely,

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<sup>2</sup> Only certificates, associate degrees, and bachelor's degrees are included in the analysis to better align this report with Tennessee's Drive to 55 initiative, which set the goal of increasing Tennessee's educational attainment to 55% by 2025.

<sup>3</sup> IPEDS is a federal dataset containing information about higher education institutions, including student demographics, program offerings, and completion data. Data are available at <https://nces.ed.gov/ipeds/>



many fields requiring a bachelor's are less clearly defined, as those who hold a bachelor's often have diverse employment opportunities in a variety of fields.

### *Wage Data by Classification of Instructional Programs (CIP) Code*

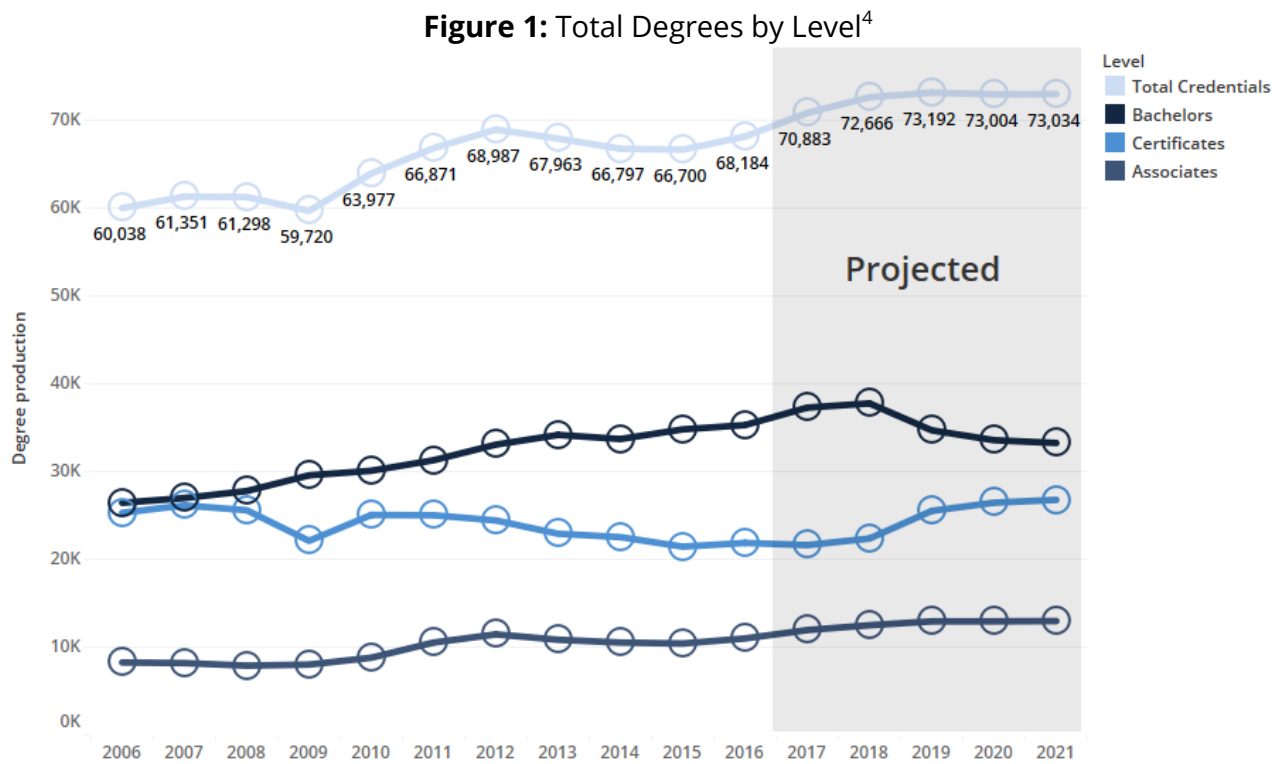
Wage data by Classification of Instructional Program (CIP) code tables are created using Tennessee's State Longitudinal Data System (SLDS), also known as P20 Connect. Detailed educational program outcome information within programs of study can be found in the appendix. With increasing concern about degree value, the appendix lists CIP level wage data for graduates of 100 public, private, and proprietary schools across Tennessee during 2017-2018 including the name of each program, its CIP code, and the average wage by program for those earning wages in Tennessee and not enrolled in school. Programs differ widely in the average wages of graduates as they enter the workforce.

# SECTION I.

# Expected Degrees

This section projects the supply of postsecondary credentials to be awarded by public, private, and proprietary institutions in Tennessee. These projections forecast various degree levels by institutional sector through academic year 2021. **Figures 1** through **4** below show historical degree production on the left and projected degree production in the shaded area to the right.

**Figure 1** displays the total degrees produced and projected at institutions of higher education in Tennessee. Degree production is expected to continue increasing in Tennessee, although this year's projections suggest more moderate growth than previous projections in this report. This is largely due to an update in the model suggesting lower overall numbers of high school graduates in the coming years. The growth in degree production is expected to occur at the certificate and associates levels.

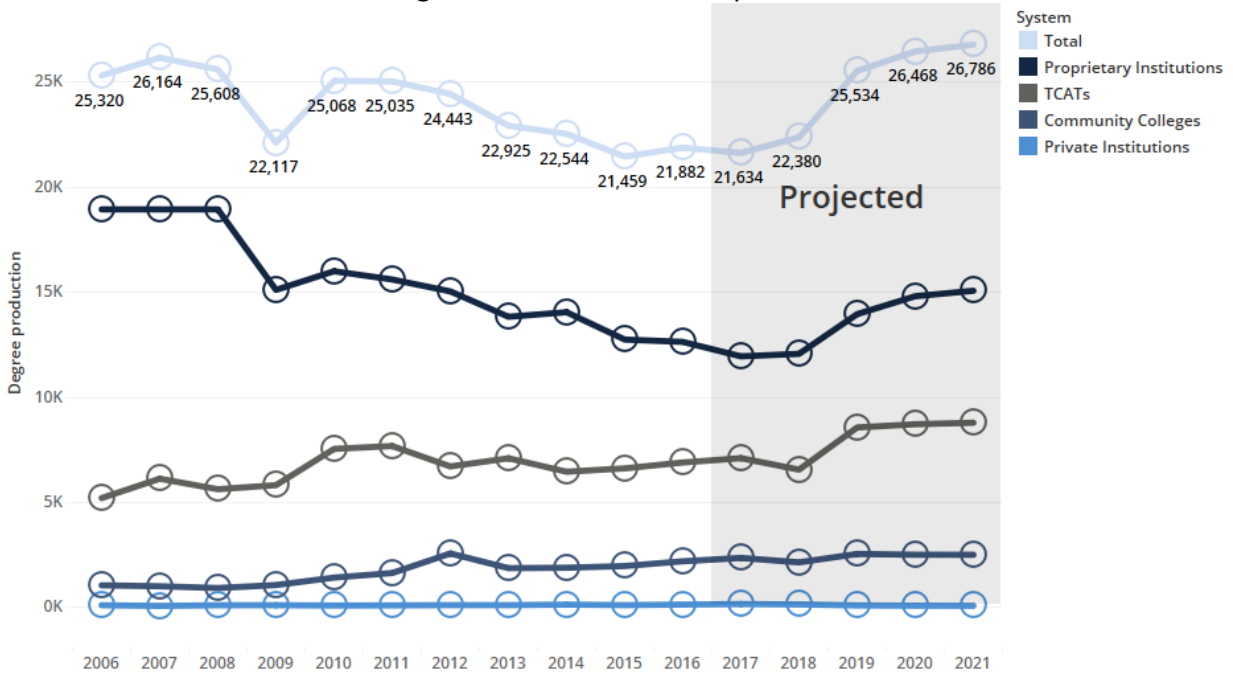


**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

**Figure 2** displays the certificates produced and projected, by sector. Overall certificate production is projected to increase in the coming years. This projected increase is most salient at the Tennessee Colleges of Applied Technology (TCATs) and proprietary institutions.

<sup>4</sup> Given that the model is built on historical data, it will take some time for the projections to account for potential declines in production due to school closures at proprietary institutions in Tennessee.

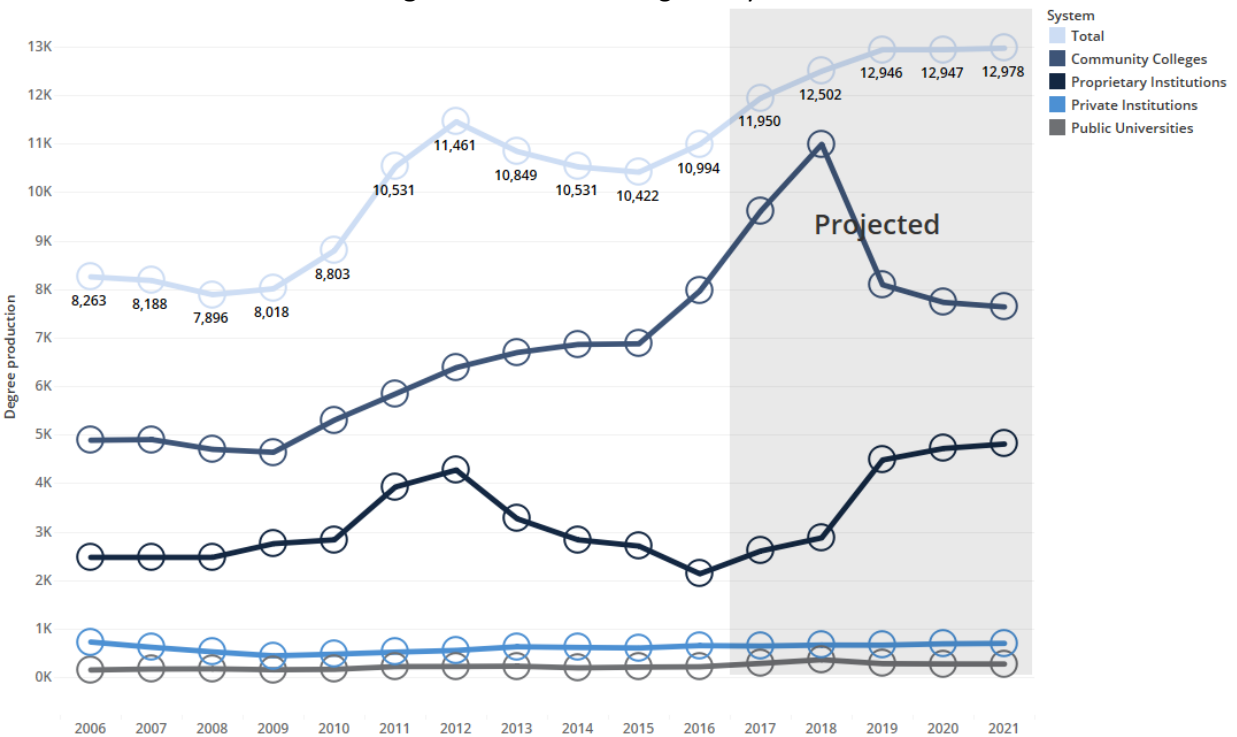
**Figure 2: Total Certificates by Sector**



**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

**Figure 3** depicts the associates degrees produced and projected, by sector. Associate degree production is expected to maintain its trajectory of growth from the past decade. Community college data in this figure are up to date through 2018. The model suggests a calming of the rapid growth in associate degree production experienced at community colleges in the past four years.

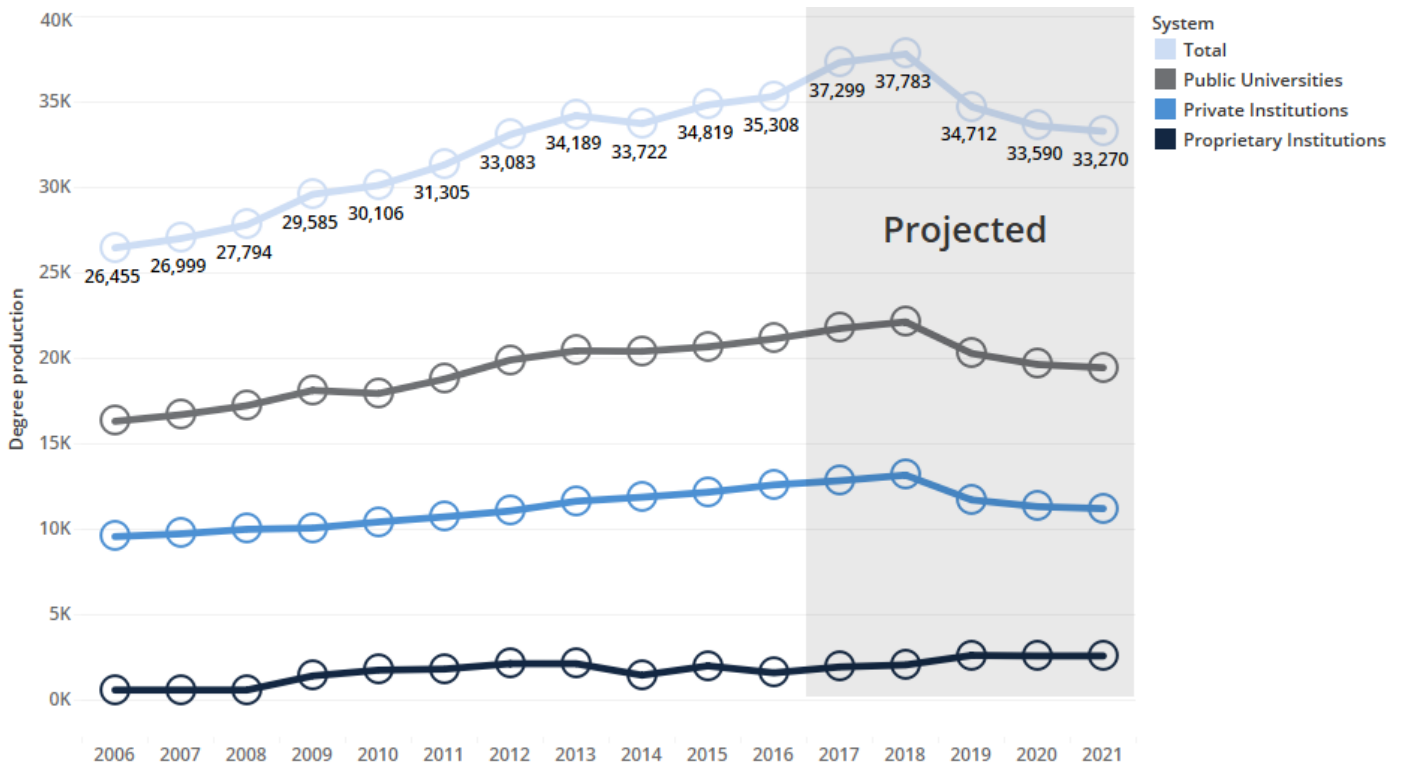
**Figure 3: Associates Degrees by Sector**



**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

**Figure 4** shows the bachelor's degrees produced and projected, by sector. Bachelor's degree production is projected to decline slightly in coming years.

**Figure 4:** Bachelor's by Sector



**Notes:** Due to delays in IPEDS final release data, the projected degrees produced begins in 2017-2018.

# SECTION II.

## State Workforce Needs

The Tennessee Department of Labor and Workforce Development’s Workforce Insights, Research and Reporting Engine Division (WIR<sup>2</sup>ED) prepares information annually on top occupations and programs of study with expected workforce demand. Several indicators have been used to identify the top occupations and programs.

- The occupation is within a program of study with an expected positive growth rate from 2016 to 2026, and in which the number of awards is no more than 1.5 times the number of total annual openings.<sup>5</sup>
- For January to March 31, 2019, for the occupation, the number of job candidates with active resumes on jobs4tn.gov was less than or equal to the number of job openings (the ratio of job candidates to job postings was 1.0 or less), indicating a shortage of applicants;
- Occupations with high or medium level employment compared to state total employment;
- Occupations with an entry-level annual wage of more than \$28,000;
- Occupations requiring at least a high school diploma or the equivalent.

<b>Clusters with the Greatest Number of Expected Annual Openings</b>	
<i>Business Management</i>	<i>14,470</i>
<i>Health Science</i>	<i>11,555</i>
<i>Education and Training</i>	<i>6,035</i>

Occupations with \$70,000 or more in entry-level wages include, among others, natural sciences managers, architecture and engineering managers, nurse anesthetists, nurse practitioners, physicians, pharmacists, and nuclear and materials engineers. Computer network architects earned nearly \$67,000 in entry-level salaries. Some of the occupations with significant shortages of trained workers include management and operations research analysts, personal financial advisors, nurse anesthetists and RNs, MRI technicians, healthcare social workers, machinery maintenance workers, police officers, software developers (applications and systems), and civil and safety engineers.

**Table 1** lists the highest demand occupations in Tennessee within 15 major clusters or areas of academic concentration. The areas of concentration range from architecture and construction to business, education, human services, information technology, manufacturing and science, technology, engineering, and mathematics (STEM), among others. The criteria used to select these occupations have been broadened to include real time data on job seekers and jobs posted from TDLWD’s extensive online database in jobs4tn.gov.

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<sup>5</sup> A program of study (POS) is a group of educational programs and related occupations for which they may train.

**Table 1: Top 25 High-Demand Occupations with the Greatest Number of Annual Openings**

<b>SOC Code</b>	<b>Occupational Title</b>	<b>Annual Openings</b>	<b>Education Level</b>	<b>Candidates Per Job Opening</b>	<b>2018 Annual Wage</b>
53-3032	Heavy and Tractor-Trailer Truck Drivers	7,615	Postsecondary Award	0.41	\$28,681
11-1021	General and Operations Managers	4,685	Bachelor's	0.71	\$45,088
29-1141	Registered Nurses	4,310	Bachelor's	0.08	\$46,748
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3,975	High school diploma	0.56	\$34,266
25-2021	Elementary School Teachers, Except Special Education	2,420	Bachelor's	0.75	\$40,928
29-2061	Licensed Practical and Licensed Vocational Nurses	2,245	Postsecondary Award	0.27	\$33,004
13-2011	Accountants and Auditors	2,185	Bachelor's	0.70	\$43,133
51-1011	First-Line Supervisors of Production and Operating Workers	1,775	High school diploma	0.70	\$36,889
11-3031	Financial Managers	1,590	Bachelor's	0.73	\$57,363
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	1,495	Bachelor's	0.55	\$41,196
21-2011	Clergy	1,465	Bachelor's	0.80	\$30,508
15-1151	Computer User Support Specialists	1,135	Postsecondary Award	0.45	\$31,765
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	1,105	High school diploma	0.71	\$40,928
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	1,080	Postsecondary Award	0.57	\$29,969
11-9111	Medical and Health Services Managers	1,060	Bachelor's	0.74	\$58,233
13-1161	Market Research Analysts and Marketing Specialists	1,055	Bachelor's	0.61	\$34,594
11-2022	Sales Managers	995	Bachelor's	0.76	\$58,387
43-5061	Production, Planning, and Expediting Clerks	970	High school diploma	0.80	\$30,504
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	965	Bachelor's	0.90	\$36,970
33-3051	Police and Sheriff's Patrol Officers	960	High school diploma	0.66	\$31,360
13-1111	Management Analysts	925	Bachelor's	0.20	\$50,770
25-1071	Health Specialties Teachers, Postsecondary	845	Doctoral or professional	0.67	\$35,106
11-9141	Property, Real Estate, and Community Association Managers	825	High school diploma	1.00	\$31,324
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	825	High school diploma	0.40	\$32,024
25-2022	Middle School Teachers, Except Special and Career/Technical Education	820	Bachelor's	.51	\$41,487



# SECTION III.

**Table 2** provides employment rates and earned wages for graduates in programs of study corresponding to the occupations in demand in Table 1. For example, accountants and auditors has been identified as a demand occupation in table 1, in program of study 04.2110000; in table 2, in program of study 04.2110000, Accounting, outcomes for graduates of accounting programs at the corresponding educational level are presented.

This table includes the number of graduates or concentrators in each program of study by level of education. Included are the number of graduates who work for employers reporting wages in Tennessee, the percent employed and their median wage six months after graduation. An estimate of their annual wage appears in the final column. These results exclude individuals who were enrolled at another educational institution in Tennessee within two quarters of graduation. For outcomes by specific educational programs within the programs of study, see the related table in the appendix. Programs of study reporting graduate placements of 80 percent or more include:

- **Certificate level-** ultrasonic technician
- **Associate degree level-** medical technicians including cardiovascular and medical records, respiratory therapy, physical therapy assistant, production maintenance and operations, and engineering technology
- **Post baccalaureate-** registered nursing, library science, and web/multimedia management, programming
- **Master's degree-** educational administration and financial planning
- **Doctorate-** occupational therapy

Clusters with the largest number of degree level completers with estimated annual median salaries greater than \$50,000 include health science, STEM , and business management. All clusters except architecture and construction, arts and communication, and human services had at least one degree-level completer with estimated median salary at this level.

**Table 2:** Employment Rates for the Programs of Study and Award Levels for the Top 25 Occupations

SOC Code	Program of Study Code	Program of Study Title	Number of Awards	Number Employed	Percent Employed
53-3032	16.1300000	Truck, Bus, Rail, Water Transportation, and Heavy Equipment	495	107	21.61%
11-1021	04.1000000	Business Management	2669	1647	61.71%
29-1141	08.1110000	Nursing (RN)	2042	1476	72.21%
43-1011	04.6000000	Administrative and Information Support	285	166	58.25%
25-2021	05.1170000	Elementary Teachers, Except Special Education	126	77	61.11%
29-2061	08.1140000	Practical Nurse (LPN)	1222	616	50.4%
13-2011	04.2110000	Accounting	592	411	69.43%
51-1011	13.1000000	Precision Production Pathway	107	74	69.16%
11-3031	06.3110000	Banking and Finance	230	120	52.17%
25-2031	05.1180000	Middle, Secondary and Vocational Education Teachers	1068	770	72.10%
21-2011	10.3120000	Religion	29	13	44.83%
15-1151	11.3400000	Web/Multimedia Management, Programming	275	190	69.09%
49-1011	13.2200000	Prod. Design, Ops, and Maintenance Path -- Operations & Maintenance	39	28	71.79%
49-9021	02.2400000	Construction Pathway - Construction HVAC/R	322	136	42.23%
11-9111	04.1000000	Business Management	2669	1647	61.71%
13-1161	14.1000000	Marketing Management and Research	586	370	63.14%
11-2022	14.2000000	Selling and Sales Management	8	5	62.50%
43-5061	14.6000000	Channel Management	---	---	---
41-4011	14.2000000	Selling and Sales Management	8	5	62.50%
33-3051	12.4130000	Law Enforcement	489	257	52.56%
13-1111	04.4000000	Business Analysis	104	52	50.00%
25-1071	08.1390000	Health Specialties Teachers, Postsecondary	---	---	---
11-9141	04.1000000	Business Management	74	41	55.4%
49-3031	16.4300000	Diesel Technology	106	66	66.2%
25-2022	05.1180000	Middle, Secondary and Vocational Education Teachers	1068	770	72.10%

**Note:** Not all programs of study had completion data in Tennessee's longitudinal data system. Those with missing data have been left blank.

There are also a number of programs that are oversupplied in the workforce. **Table 3** presents the programs that graduate a significantly larger number of students than jobs expected to be available, leading to very strong competition for individuals trained in the occupations. Additional information on industry and occupational trends can be found in *Tennessee's Economy 2018*<sup>6</sup> and *The Demand for STEM Occupations in Tennessee*<sup>7</sup>.

**Table 3: Oversupplied Programs**

<b>Program of Study Code</b>	<b>Program of Study Title</b>
05.1130000	Support Services- Interpreters/Translators
05.1230000	Postsecondary Teachers- Teacher Education
08.1280000	Optometry
08.1360000	Radiation Therapy
08.1410000	Exercise Physiology
08.4140000	Dietitian Assistance
11.3100000	Interactive Media
15.1120000	Chemical Engineering
15.1220000	Biomedical Engineering

<sup>6</sup> <https://www.tn.gov/workforce/general-resources/major-publications0/major-publications-redirect/public-reports-redirect/tennessees-economy.html>

<sup>7</sup> <https://www.jobs4tn.gov/admin/gsipub/htmlarea/uploads/LMI/Publications/STEMReport2019Updated.pdf>

# Institutions Offering Programs in High-Demand Occupations

The following section presents the academic programs available at public, private, and proprietary postsecondary institutions in Tennessee that produce graduates who are employable in each high-demand program of study<sup>8</sup> (corresponding to the program of study codes in **Table 2**).<sup>9</sup> Each table includes the institution name, the system to which the institution belongs,<sup>10</sup> the grand division in which the institution is located, and the degree level offered by the institution (certificate, associate degree, bachelor's, graduate certificate, or graduate degree).

## *Truck, Bus, Rail, Water Transportation, and Heavy Equipment*

Careers in this program of study include heavy and tractor trailer truck drivers and bus drivers, . The typical education requirement is a postsecondary award. Postsecondary certificates in this program of study are available at the following institutions:

Institution Name	System	Grand Division
TCAT Memphis	TBR	East
TCAT Newbern	TBR	East
TCAT Shelbyville	TBR	Middle
TCAT Crossville	TBR	West
TCAT Jackson	TBR	East
TCAT Knoxville	TBR	West
TCAT Nashville	TBR	Middle
Fortis Institute-Cookeville	Proprietary	Middle
Platt College-Miller-Motte Technical-Chattanooga	Proprietary	East
Vatterott College-Applying Farms	Proprietary	East

## *Business Management*

Careers in this program of study include general managers, medical managers, real estate managers, and administrative services managers. The typical education requirement is a bachelor's degree. Bachelor's degrees in this program of study are available at the following institutions:

Institution Name	System	Grand Division
Austin Peay State University	LGI	Middle
Baptist Memorial College of Health Sciences	TICUA	West
Belmont University	TICUA	Middle
Bethel University	TICUA	West
Bryan College-Dayton	TICUA	East
Carson-Newman University	TICUA	East

<sup>8</sup> These programs were identified by TDLWD as providing the necessary award to enter a respective field. Additional institutions and programs may exist that prepare students to enter a respective field of work.

<sup>9</sup> Some of the closely-related occupations share the same program of study code, so there are only 19 programs of study detailed in this section. These 19 programs of study encompass all 25 high-demand occupations.

<sup>10</sup> Institutions are identified as part of the Tennessee Board of Regents (TBR), University of Tennessee (UT), or TICUA or are listed as Private, non-profit or Proprietary (for-profit). Public four-year institutions that were formerly governed by TBR are now identified as locally governed institutions (LGIs).

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Christian Brothers University	TICUA	West
Cumberland University	TICUA	Middle
Daymar College-Clarksville	Proprietary	Middle
Daymar College-Nashville	Proprietary	Middle
DeVry University-Tennessee	Proprietary	Middle
East Tennessee State University	LGI	East
Fisk University	TICUA	Middle
Freed-Hardeman University	TICUA	West
Johnson University	TICUA	East
King University	TICUA	East
Lane College	TICUA	West
Le Moyne-Owen College	TICUA	West
Lee University	TICUA	East
Lincoln Memorial University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Maryville College	TICUA	East
Middle Tennessee State University	LGI	Middle
Milligan College	TICUA	East
Rhodes College	TICUA	West
South College	Proprietary	East
Southern Adventist University	TICUA	East
Strayer University-Tennessee	Proprietary	West
Tennessee State University	LGI	Middle
Tennessee Technological University	LGI	Middle
Tennessee Wesleyan University	TICUA	East
The University of Tennessee-Chattanooga	UT	East
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	UT	West
Trevecca Nazarene University	TICUA	Middle
Tusculum College	TICUA	East
Union University	TICUA	West
University of Memphis	LGI	West
University of Phoenix-Tennessee	Proprietary	Middle
Visible Music College	Private, non-profit	West
Welch College	TICUA	Middle

## *Nursing (RN)*

Careers in this program of study include registered nurses, nurse midwives, and nursing instructors. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Austin Peay State University	LGI	Middle
Baptist Memorial College of Health Sciences	TICUA	West
Belmont University	TICUA	Middle
Bethel University	TICUA	West
Carson-Newman University	TICUA	East
Cumberland University	TICUA	Middle
East Tennessee State University	LGI	East
Freed-Hardeman University	TICUA	West
King University	TICUA	East
Lee University	TICUA	East
Lincoln Memorial University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Middle Tennessee State University	LGI	Middle
Milligan College	TICUA	East
South College	Proprietary	East
Southern Adventist University	TICUA	East
Tennessee State University	LGI	Middle
Tennessee Technological University	LGI	Middle
Tennessee Wesleyan University	TICUA	East
The University of Tennessee-Chattanooga	UT	East
The University of Tennessee-Health Science Center	UT	West
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	UT	West
Trevecca Nazarene University	TICUA	Middle
Tusculum College	TICUA	East
Union University	TICUA	West
University of Memphis	LGI	West

## *Administrative and Information Support*

Careers in this program of study include customer service representatives, secretaries and administrative assistants, first-line supervisors of office and administrative staff. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Allied Health Careers Institute	Proprietary	Middle
Bethel University	TICUA	West
Brightwood College-Nashville	Proprietary	Middle
Chattanooga College Medical Dental and Technical Careers	Proprietary	East
Chattanooga State Community College	TBR	East
Cleveland State Community College	TBR	East
Concorde Career College-Memphis	Proprietary	West
Daymar College Clarksville	Proprietary	Middle
Daymar College Murfreesboro	Proprietary	Middle
Daymar College Nashville	Proprietary	Middle
Motlow State Community College	TBR	Middle
Nashville College of Medical Careers	Proprietary	Middle
Nashville State Community College	TBR	Middle
National College-Nashville	Proprietary	Middle
Northeast State Community College	TBR	East
Pellissippi State Community College	TBR	East
Platt College-Miller-Motte Technical-Chattanooga	Proprietary	East
Remington College-Memphis Campus	Private, non-profit	West
Roane State Community College	TBR	East
Southwest Tennessee Community College	TBR	West
TCAT Nashville	TBR	Middle
TCAT Athens	TBR	East
TCAT Covington	TBR	West
TCAT Crossville	TBR	East
TCAT Crump	TBR	West
TCAT Dickson	TBR	Middle
TCAT Elizabethton	TBR	East
TCAT Harriman	TBR	East
TCAT Hartsville	TBR	Middle
TCAT Hohenwald	TBR	Middle
TCAT Jacksboro	TBR	East
TCAT Jackson	TBR	West
TCAT Knoxville	TBR	East
TCAT Livingston	TBR	Middle
TCAT McKenzie	TBR	West



TCAT Memphis	TBR	West
TCAT Morristown	TBR	East
TCAT Murfreesboro	TBR	Middle
TCAT Oneida-Huntsville	TBR	East
TCAT Paris	TBR	West
TCAT Pulaski	TBR	Middle
TCAT Ripley	TBR	West
TCAT Shelbyville	TBR	Middle
TCAT Whiteville	TBR	West
The University of Tennessee Health Science Center	TBR	#N/A
Vatterott College-Applying Farms	Proprietary	West
Vatterott College-Dividend	Proprietary	West
Virginia College-Chattanooga	Proprietary	East
Virginia College-Knoxville	Proprietary	East
Volunteer State Community College	TBR	Middle
Walters State Community College	TBR	East

### *Elementary Teachers, Except Special Education*

Careers in this program of study include elementary school teachers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Belmont University	TICUA	Middle
Bethel University	TICUA	West
Bryan College-Dayton	TICUA	East
Carson-Newman University	TICUA	East
Christian Brothers University	TICUA	West
Cumberland University	TICUA	Middle
East Tennessee State University	LGI	East
Freed-Hardeman University	TICUA	West
Johnson University	TICUA	East
Lee University	TICUA	East
Lincoln Memorial University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Northeast State Community College	TBR	East
South College	Proprietary	East
Southern Adventist University	TICUA	East
Tennessee State University	LGI	Middle
Tennessee Technological University	LGI	Middle
Tennessee Wesleyan University	TICUA	East
The University of Tennessee-Chattanooga	UT	East

Trevecca Nazarene University	TICUA	Middle
Union University	TICUA	West
Vanderbilt University	TICUA	Middle
Welch College	TICUA	Middle

### *Practical Nursing (LPN)*

Careers in this program of study include licensed practical and licensed vocational nurses. The typical education requirement is a postsecondary certificate. Postsecondary certificates in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
TCAT Athens	TBR	Middle
TCAT Covington	TBR	East
TCAT Dickson	TBR	Middle
Chattanooga College Medical Dental and Technical Careers	Proprietary	Middle
TCAT Elizabethton	TBR	West
TCAT Harriman	TBR	West
TCAT Hartsville	TBR	Middle
TCAT Hohenwald	TBR	Middle
TCAT Jacksboro	TBR	West
Lincoln Memorial University	TICUA	West
TCAT Livingston	TBR	Middle
TCAT Memphis	TBR	East
TCAT Morristown	TBR	West
TCAT Murfreesboro	TBR	Middle
TCAT Newbern	TBR	East
TCAT Paris	TBR	East
TCAT Pulaski	TBR	Middle
TCAT Ripley	TBR	East
TCAT Crump	TBR	East

### *Accounting*

Careers in this program of study include customer accountants and auditors. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Austin Peay State University	LGI	Middle
Belmont University	TICUA	Middle
Bethel University	TICUA	West
Carson-Newman University	TICUA	East
Christian Brothers University	TICUA	West
Cumberland University	TICUA	Middle

DeVry University-Tennessee	Proprietary	Middle
East Tennessee State University	LGI	East
Freed-Hardeman University	TICUA	West
Le Moyne-Owen College	TICUA	West
Lee University	TICUA	East
Lincoln Memorial University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Maryville College	TICUA	East
Middle Tennessee State University	LGI	Middle
Milligan College	TICUA	East
National College-Nashville	Proprietary	Middle
Rhodes College	TICUA	West
South College	Proprietary	East
Southern Adventist University	TICUA	East
Strayer University-Tennessee	Proprietary	West
Tennessee State University	LGI	Middle
Tennessee Technological University	LGI	Middle
Tennessee Wesleyan University	TBR	East
The University of Tennessee-Chattanooga	TBR	East
The University of Tennessee-Knoxville	TBR	East
The University of Tennessee-Martin	TBR	West
Trevecca Nazarene University	TBR	Middle
Union University	TBR	West
University of Memphis	TBR	West
University of Phoenix-Tennessee	TBR	Middle
Vanderbilt University	TBR	Middle

### *Precision Production Pathway*

Careers in this program of study include machinists, team assemblers, machine setters and operators, and tool and die makers. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Northeast State Community College	TBR	East
TCAT Athens	TBR	East
TCAT Covington	TBR	West
TCAT Crossville	TBR	East
TCAT Crump	TBR	West
TCAT Dickson	TBR	Middle
TCAT Harriman	TBR	East

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
TCAT Hartsville	TBR	Middle
TCAT Hohenwald	TBR	Middle
TCAT Jacksboro	TBR	East
TCAT Jackson	TBR	West
TCAT Knoxville	TBR	East
TCAT Livingston	TBR	Middle
TCAT McKenzie	TBR	West
TCAT McMinnville	TBR	Middle
TCAT Memphis	TBR	West
TCAT Morristown	TBR	East
TCAT Murfreesboro	TBR	Middle
TCAT Nashville	TBR	Middle
TCAT Newbern	TBR	West
TCAT Oneida-Huntsville	TBR	East
TCAT Paris	TBR	West
TCAT Pulaski	TBR	Middle
TCAT Shelbyville	TBR	Middle
TCAT Whiteville	TBR	West
William Moore College of Technology	Private, non-profit	West

### *Banking and Finance*

Careers in this program of study include insurance sales agents, financial managers, and loan officers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Belmont University	TICUA	Middle
Carson-Newman University	TICUA	East
Christian Brothers University	TICUA	West
East Tennessee State University	LGI	East
Lipscomb University	TICUA	Middle
Maryville College	TICUA	East
Middle Tennessee State University	LGI	Middle
Milligan College	TICUA	East
Rhodes College	TICUA	West
Roane State Community College	TBR	East
Southern Adventist University	TICUA	East
Strayer University-Tennessee	Proprietary	West
Tennessee State University	LGI	Middle
Tennessee Technological University	LGI	Middle

The University of Tennessee-Chattanooga	UT	East
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	UT	West
The University of the South	TICUA	Middle
Union University	TICUA	West
University of Memphis	LGI	West
Vanderbilt University	TICUA	Middle

### *Middle, Secondary and Vocational Education Teachers*

Careers in this program of study include secondary school teachers, middle school teachers, and career and technical education teachers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Austin Peay State University	LGI	Middle
Belmont University	TICUA	Middle
Bethel University	TICUA	West
Bryan College-Dayton	TICUA	East
Carson-Newman University	TICUA	East
Cumberland University	TICUA	Middle
East Tennessee State University	LGI	East
Freed-Hardeman University	TICUA	West
Johnson University	TICUA	East
King University	TICUA	East
Lane College	TICUA	West
Lee University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Maryville College	TICUA	East
Middle Tennessee State University	LGI	Middle
Southern Adventist University	TICUA	East
Tennessee State University	LGI	Middle
Tennessee Technological University	LGI	Middle
Tennessee Wesleyan University	TICUA	East
The University of Tennessee-Chattanooga	UT	East
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	UT	West
Trevecca Nazarene University	TICUA	Middle
Tusculum College	TICUA	East
Union University	TICUA	West
University of Memphis	LGI	West
Vanderbilt University	TICUA	Middle
Welch College	TICUA	Middle

## Religion

Careers in this program of study include clergy and postsecondary philosophy and religion teachers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

Institution Name	System	Grand Division
Austin Peay State University	LGI	Middle
Belmont University	TICUA	Middle
Bryan College-Dayton	TICUA	East
Carson-Newman University	TICUA	East
Christian Brothers University	TICUA	West
East Tennessee State University	LGI	East
Freed-Hardeman University	TICUA	West
Johnson University	TICUA	East
King University	TICUA	East
Lane College	TICUA	West
Lee University	TICUA	East
Lincoln Memorial University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Maryville College	TICUA	East
Memphis Theological Seminary	Private, non-profit	West
Middle Tennessee State University	LGI	Middle
Mid-South Christian College	Private, non-profit	West
Milligan College	TICUA	East
Pentecostal Theological Seminary	#N/A	#N/A
Rhodes College	TICUA	West
Southern Adventist University	TICUA	East
The University of Tennessee-Chattanooga	UT	East
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	TBR	West
The University of the South	TBR	#N/A
Trevecca Nazarene University	TBR	Middle
Union University	TBR	West
University of Memphis	TBR	West
Vanderbilt University	TBR	Middle
Welch College	TBR	Middle

## *Web/Multimedia Management, Programming*

Careers in this program of study include computer support specialists, computer systems analysts, software developers, and computer and information systems managers. The typical education requirement is a postsecondary award or a bachelor's. Associate degrees and/or bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Austin Peay State University	LGI	Middle
Belmont University	TICUA	Middle
Bethel University	TICUA	West
Carson-Newman University	TICUA	East
Chattanooga State Community College	TBR	East
Christian Brothers University	TICUA	West
Cleveland State Community College	TBR	East
Columbia State Community College	TBR	Middle
Daymar College-Clarksville	Proprietary	Middle
DeVry University-Tennessee	Proprietary	Middle
Dyersburg State Community College	TBR	West
East Tennessee State University	LGI	East
Fisk University	TICUA	Middle
Freed-Hardeman University	TICUA	West
Jackson State Community College	TBR	West
King University	TICUA	East
Lane College	TICUA	West
Le Moyne-Owen College	TICUA	West
Lee University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Maryville College	TICUA	East
Middle Tennessee State University	LGI	Middle
Milligan College	TICUA	East
Nashville State Community College	TBR	Middle
National College-Nashville	Proprietary	Middle
Northeast State Community College	TBR	East
Pellissippi State Community College	TBR	East
Rhodes College	TICUA	West
Roane State Community College	TBR	East
Sewanee-The University of the South	TICUA	Middle
Southern Adventist University	TICUA	East
Southwest Tennessee Community College	TBR	West
Strayer University-Tennessee	Proprietary	West
Tennessee State University	LGI	Middle
Tennessee Technological University	LGI	Middle
The University of Tennessee-Chattanooga	UT	East

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	UT	West
Trevecca Nazarene University	TICUA	Middle
Union University	TICUA	West
University of Memphis	LGI	West
University of Phoenix-Tennessee	Proprietary	Middle
Vanderbilt University	TICUA	Middle
Volunteer State Community College	TBR	Middle
Walters State Community College	TBR	East

### *Production, Design, Operations, and Maintenance Path – Operations & Maintenance*

Careers in this program of study include maintenance and repair workers, inspectors, mechanics, and purchasing agents. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Chattanooga State Community College	TBR	East
Cleveland State Community College	TBR	East
Columbia State Community College	TBR	Middle
Dyersburg State Community College	TBR	West
Motlow State Community College	TBR	Middle
Nashville State Community College	TBR	Middle
Pellissippi State Community College	TBR	East
Roane State Community College	TBR	East
Southwest Tennessee Community College	TBR	West
TCAT Athens	TBR	East
TCAT Covington	TBR	West
TCAT Crossville	TBR	East
TCAT Crump	TBR	West
TCAT Dickson	TBR	Middle
TCAT Elizabethton	TBR	East
TCAT Harriman	TBR	East
TCAT Hartsville	TBR	Middle
TCAT Hohenwald	TBR	Middle
TCAT Jackson	TBR	West
TCAT Knoxville	TBR	East
TCAT Livingston	TBR	Middle
TCAT McKenzie	TBR	West
TCAT McMinnville	TBR	Middle
TCAT Memphis	TBR	West
TCAT Morristown	TBR	East
TCAT Murfreesboro	TBR	Middle



Institution Name	System	Grand Division
TCAT Newbern	TBR	West
TCAT Paris	TBR	West
TCAT Pulaski	TBR	Middle
TCAT Ripley	TBR	West
TCAT Shelbyville	TBR	Middle
TCAT Whiteville	TBR	West

### *Construction Pathway - Construction HVAC/R*

Careers in this program of study include Heating, Air Conditioning, and Refrigeration Mechanics. The typical education requirement is a postsecondary certificate. Postsecondary certificates are available at the following institutions:

Institution Name	System	Grand Division
Northeast State Community College	TBR	East
TCAT Athens	TBR	East
TCAT Covington	TBR	West
TCAT Crossville	TBR	East
TCAT Crump	TBR	West
TCAT Dickson	TBR	Middle
TCAT Harriman	TBR	East
TCAT Hartsville	TBR	Middle
TCAT Hohenwald	TBR	Middle
TCAT Jacksboro	TBR	East
TCAT Jackson	TBR	West
TCAT Knoxville	TBR	East
TCAT Livingston	TBR	Middle
TCAT McKenzie	TBR	West
TCAT McMinnville	TBR	Middle
TCAT Memphis	TBR	West
TCAT Morristown	TBR	East
TCAT Murfreesboro	TBR	Middle
TCAT Nashville	TBR	Middle
TCAT Newbern	TBR	West
TCAT Oneida-Huntsville	TBR	East
TCAT Paris	TBR	West
TCAT Pulaski	TBR	Middle
TCAT Shelbyville	TBR	Middle
TCAT Whiteville	TBR	West
William Moore College of Technology	Private, non-profit	West

## *Marketing Management and Research*

Careers in this program of study include market research analysts, marketing managers, and advertising and promotion managers. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Austin Peay State University	LGI	Middle
Belmont University	TICUA	Middle
Carson-Newman University	TICUA	East
Christian Brothers University	TICUA	West
Cumberland University	TICUA	Middle
East Tennessee State University	LGI	East
Freed-Hardeman University	TICUA	West
Lee University	TICUA	East
Lincoln Memorial University	TICUA	East
Lipscomb University	TICUA	Middle
Maryville College	TICUA	East
Middle Tennessee State University	LGI	Middle
South College	Proprietary	East
Southern Adventist University	TICUA	East
Tennessee Technological University	LGI	Middle
Tennessee Wesleyan University	TICUA	East
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	UT	West
Trevecca Nazarene University	TICUA	Middle
Union University	TICUA	West
University of Memphis	LGI	West
University of Phoenix-Tennessee	Proprietary	Middle

## *Selling and Sales Management*

Careers in this program of study include sales representatives, sales managers, real estate agents, and advertising agents. The typical education requirement is a bachelor's. Bachelor's and/or graduate degrees in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
East Tennessee State University	LGI	East
Southern Adventist University	TICUA	East

## *Law Enforcement*

Careers in this program of study include police officers, emergency dispatchers, detectives, and criminal investigators. The typical education requirement is a high school diploma. Postsecondary certificates in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Cleveland State Community College	TBR	East

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Daymar College-Clarksville	Proprietary	Middle
Daymar College-Murfreesboro	Proprietary	Middle
Dyersburg State Community College	TBR	West
Nashville State Community College	TBR	Middle
Volunteer State Community College	TBR	Middle
Walters State Community College	TBR	East

### *Business Analysis*

Careers in this program of study include business operations specialists, management analysts, and operations research analysts. The typical education requirement is a bachelor's. Bachelor's in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
Belmont University	TICUA	Middle
Bethel University	TICUA	West
Carson-Newman University	TICUA	East
Christian Brothers University	TICUA	West
DeVry University-Tennessee	Proprietary	Middle
Lee University	TICUA	East
Lipscomb University	TICUA	Middle
Martin Methodist College	TICUA	Middle
Maryville College	TICUA	East
Middle Tennessee State University	LGI	Middle
Southern Adventist University	TICUA	East
The University of Tennessee-Knoxville	UT	East
The University of Tennessee-Martin	UT	West
University of Memphis	LGI	West
Vanderbilt University	TICUA	Middle

### *Diesel Technology*

Careers in this program of study include bus and truck mechanics and diesel engine specialists. The typical education requirement is a postsecondary credential. Postsecondary credentials in this program of study are available at the following institutions:

<b>Institution Name</b>	<b>System</b>	<b>Grand Division</b>
TCAT Elizabethton	TBR	West Region
TCAT Harriman	TBR	West Region
TCAT Livingston	TBR	Middle Region
TCAT Memphis	TBR	East Region
Lincoln College of Technology-Nashville	Proprietary	Middle Region
TCAT Newbern	TBR	East Region
TCAT Knoxville	TBR	West Region
Vatterott College-Applying Farms	Proprietary	East Region

# SECTION IV.

## *Limitations*

Supply and demand analyses are useful for educators, employers, and policymakers, but there are two underlying limitations.

First, supply and demand analyses rely on historical data and assumptions about future economic conditions, as well as industry expansion or contraction. For this reason, projections are sometimes inaccurate for certain occupations, particularly emerging fields with limited historical data and those fields with high supply-to-demand ratios (oversupplied fields).

Second, the relationship between supply and demand is most direct at the sub-baccalaureate level and with specialized programs at the doctoral and professional level. For example, a person with a certificate in automotive repair or a medical specialization in cardiology is more likely to hold a job specific to their field of study than a person with a bachelor's degree in English. As such, it is more straightforward to link individuals with specialized degrees to specific occupations. This is not as true for those with versatile bachelor's and master's degrees, as graduates with these degrees are employable in many fields.

## *Conclusions*

Projections of postsecondary degree production indicate that certificates and associates degrees will continue to grow in annual production, while bachelor's degrees decrease slightly. These projections will continue to change as the data that inform them update. The degree production models listed in this report should serve as a guide for understanding future degree production trends.

Many of the in-demand occupations listed in this report have made this list for several years. Policymakers should strongly consider the ways in which they might help bolster the workforce talent pool for all in-demand occupations, but particularly those for which the state is consistently undersupplied. This includes programs of study like business management, nursing, and web/multimedia management programming.

Occupational demand varies by region, as this report has highlighted in its regional demand tables in Appendix B. While many of the occupational demands are the same across the state, the number and nature of the in demand occupations is region specific. These tables should serve as a guide to regional workforce planning for communities, policymakers, and institutions of higher education.

Finally, for the first time this report included wage data by CIP code. These data should help inform students as they mark out their career paths. These tables highlight the many academic programs that have provided good labor market outcomes for Tennesseans. In particular, this section highlights a number of certificates and degrees of no more than two years that have been associated with wages at or above \$28,000 after graduation. These types of programs could be tuition- and fee- free for many Tennesseans under Tennessee Promise or Reconnect, and could help improve labor market outcomes for students.

# APPENDIX

## Appendix A: Program of Study Clusters

Similar academic programs are grouped into 16 program of study clusters. **Table B-1** lists the two-digit cluster codes as well as the cluster titles, provided by TDLWD.

**Table A-1:** Program of Study Cluster Codes and Titles

Two-Digit Program of Study Cluster Code	Program of Study Cluster Title
01.0	Agriculture, Food, and Natural Resources
02.0	Architecture and Construction
03.0	Arts, A/V Technology, and Communications
04.0	Business Management and Administration
05.0	Education and Training
06.0	Finance
07.0	Government and Public Administration
08.0	Health Science
09.0	Hospitality and Tourism
10.0	Human Service
11.0	Information Technology
12.0	Public Safety, Corrections, and Security
13.0	Manufacturing
14.0	Sales
15.0	Science, Technology, Engineering, and Mathematics
16.0	Transportation

Source: TDLWD

# Appendix B: Regional Workforce Demand

**Figure B-1:** Map of Tennessee Regions



Source: TNECD, LEAP Report Dashboard

**Table B-3:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

### East Region

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
53-3032	Heavy and Tractor-Trailer Truck Drivers	1235	Postsecondary award	0.67	\$29,172
11-1021	General and Operations Managers	825	Bachelor's	0.90	\$41,282
29-1141	Registered Nurses	605	Bachelor's	0.14	\$43,773
29-2061	Licensed Practical and Licensed Vocational Nurses	350	Postsecondary award	0.35	\$32,371
51-1011	First-Line Supervisors of Production and Operating Workers	330	High school diploma	0.42	\$37,162
13-1199	Business Operations Specialists, All Other	265	Bachelor's	0.87	\$32,347
11-3031	Financial Managers	250	Bachelor's	0.91	\$49,767
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	240	Bachelor's	0.23	\$40,912
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	215	Postsecondary award	0.94	\$31,363
33-3051	Police and Sheriff's Patrol Officers	180	High school diploma	0.85	\$30,578



**Table B-2:** Top 10 High-Demand Occupations with the Greatest Number of Annual Opening**Greater Memphis Region**

<b>SOC Code</b>	<b>Occupational Title</b>	<b>Annual Openings</b>	<b>Education Level</b>	<b>Candidates per Job opening</b>	<b>2018 Annual Wage</b>
53-3032	Heavy and Tractor-Trailer Truck Drivers	1415	Postsecondary award	0.33	\$31,354
11-1021	General and Operations Managers	810	Bachelor's	0.58	\$54,505
29-1141	Registered Nurses	715	Bachelor's	0.09	\$52,482
43-1011	First-Line Supervisors of Office and Administrative Support Workers	620	High school diploma	0.84	\$37,090
13-2011	Accountants and Auditors	340	Bachelor's	0.55	\$46,739
29-2061	Licensed Practical and Licensed Vocational Nurses	285	Postsecondary Award	0.24	\$34,596
11-3031	Financial Managers	280	Bachelor's	0.51	\$62,443
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	265	Bachelor's	0.38	\$44,311
21-2011	Clergy	245	Bachelor's	0.83	\$34,360
13-1161	Market Research Analysts and Marketing Specialists	235	Bachelor's	0.44	\$38,412

**Table B-3:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings**Northeast Region**

<b>SOC Code</b>	<b>Occupational Title</b>	<b>Annual Openings</b>	<b>Education Level</b>	<b>Candidates per Job opening</b>	<b>2018 Annual Wage</b>
29-2061	Licensed Practical and Licensed Vocational Nurses	180	Postsecondary Award	0.62	\$30,208
21-2011	Clergy	90	Bachelor's	1	\$32,933
13-1199	Business Operations Specialists, All Other	70	Bachelor's	0.22	\$36,442
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	60	Postsecondary Award	0.8	\$32,974
13-1161	Market Research Analysts and Marketing Specialists	40	Bachelor's	0.53	\$28,304
15-1132	Software Developers, Applications	40	Bachelor's	0.71	\$45,130
29-1051	Pharmacists	35	Doctoral or professional	0.36	\$84,212

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
47-2211	Sheet Metal Workers	30	High school diploma	0.6	\$29,383
29-2034	Radiologic Technologists	30	Associate's degree	0.8	\$38,194
29-1126	Respiratory Therapists	25	Associate's degree	0.4	\$34,282

**Table B-4:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Northwest Region**

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
11-1021	General and Operations Managers	80	Bachelor's	0.79	\$39,960
31-2021	Physical Therapist Assistants	25	Associate's	0.71	\$44,659
49-9051	Electrical Power-Line Installers and Repairers	20	High school diploma	0.38	\$49,116
29-1123	Physical Therapists	15	Doctoral or professional	0.13	\$66,147
17-3023	Electrical and Electronics Engineering Technicians	10	Associate's	0.50	n/a
21-1022	Healthcare Social Workers	10	Master's	0.50	\$34,443
17-2199	Engineers, All Other	5	Bachelor's	0.38	\$34,050
29-1122	Occupational Therapists	5	Master's	0.07	\$66,673
17-2071	Electrical Engineers	5	Bachelor's	0.33	\$66,819
45-2011	Agricultural Inspectors	5	Bachelor's	1.00	\$38,014

**Table B-5:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Northern Middle Region**

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
53-3032	Heavy and Tractor-Trailer Truck Drivers	2150	Postsecondary Award	0.25	\$32,636
11-1021	General and Operations Managers	1805	Bachelor's	0.65	\$51,280

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
43-1011	First-Line Supervisors of Office and Administrative Support Workers	1585	High school diploma	0.28	\$37,082
29-1141	Registered Nurses	1300	Bachelor's	0.04	\$48,943
41-3099	Sales Representatives, Services, All Other	1110	High school diploma	0.57	\$29,964
13-2011	Accountants and Auditors	1050	Bachelor's	0.48	\$43,840
11-3031	Financial Managers	685	Bachelor's	0.63	\$64,293
25-2021	Elementary School Teachers, Except Special Education	655	Bachelor's	0.30	\$41,065
29-2061	Licensed Practical and Licensed Vocational Nurses	650	Postsecondary Award	0.09	\$34,663
13-1199	Business Operations Specialists, All Other	635	Bachelor's	0.28	\$38,232

**Table B-6:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Southern Middle Region**

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	190	High school diploma	1.00	\$46,438
43-1011	First-Line Supervisors of Office and Administrative Support Workers	160	High school diploma	0.39	\$32,479
29-1141	Registered Nurses	150	Bachelor's	0.07	\$45,422
29-2061	Licensed Practical and Licensed Vocational Nurses	145	Postsecondary Award	0.31	\$33,889
17-2112	Industrial Engineers	100	Bachelor's	0.08	\$60,414
47-2111	Electricians	95	High school diploma	0.75	\$45,538
43-5061	Production, Planning, and Expediting Clerks	90	High school diploma	0.54	\$31,549
25-2022	Middle School Teachers, Except Special and Career/Technical Education	70	Bachelor's	1.00	\$39,034
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	70	High school diploma	0.35	\$39,634
33-3051	Police and Sheriff's Patrol Officers	65	High school diploma	0.54	\$30,297

**Table B-7:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings**Southeast Tennessee Region**

<b>SOC Code</b>	<b>Occupational Title</b>	<b>Annual Openings</b>	<b>Education Level</b>	<b>Candidates per Job opening</b>	<b>2018 Annual Wage</b>
29-1141	Registered Nurses	465	Bachelor's	0.07	\$45,569
11-1021	General and Operations Managers	440	Bachelor's	0.67	\$40,859
43-1011	First-Line Supervisors of Office and Administrative Support Workers	420	High school diploma	1.00	\$33,563
25-2021	Elementary School Teachers, Except Special Education	260	Bachelor's	0.47	\$42,477
51-1011	First-Line Supervisors of Production and Operating Workers	245	High school diploma	0.52	\$37,610
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	235	Bachelor's	0.05	\$44,196
41-3099	Sales Representatives, Services, All Other	210	High school diploma	1.00	\$31,222
29-2061	Licensed Practical and Licensed Vocational Nurses	200	Postsecondary Award	0.22	\$33,883
11-9199	Managers, All Other	170	Bachelor's	0.85	\$45,939
11-3031	Financial Managers	145	Bachelor's	0.62	\$54,134

**Table B-8:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings**Southwest Tennessee Region**

<b>SOC Code</b>	<b>Occupational Title</b>	<b>Annual Openings</b>	<b>Education Level</b>	<b>Candidates per Job opening</b>	<b>2018 Annual Wage</b>
29-1141	Registered Nurses	200	Bachelor's	0.16	\$43,067
11-1021	General and Operations Managers	140	Bachelor's	0.48	\$43,729
29-2061	Licensed Practical and Licensed Vocational Nurses	115	Postsecondary Award	0.36	\$31,282
43-1011	First-Line Supervisors of Office and Administrative Support Workers	115	High school diploma	0.80	\$32,576
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	35	High school diploma	1.00	\$31,903
31-9091	Dental Assistants	25	Postsecondary Award	0.88	\$30,632

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	25	Bachelor's	0.22	\$40,616
41-1012	First-Line Supervisors of Non-Retail Sales Workers	20	High school diploma	1.00	\$48,472
53-7032	Excavating and Loading Machine and Dragline Operators	20	High school diploma	0.30	n/a
13-2072	Loan Officers	20	Bachelor's	1.00	\$40,247

**Table B-9:** Top 10 High-Demand Occupations with the Greatest Number of Annual Openings

**Upper Cumberland Region**

SOC Code	Occupational Title	Annual Openings	Education Level	Candidates per Job opening	2018 Annual Wage
29-1141	Registered Nurses	155	Bachelor's	0.18	\$48,076
11-1021	General and Operations Managers	140	Bachelor's	1.67	\$39,261
29-2061	Licensed Practical and Licensed Vocational Nurses	130	Postsecondary Award	0.43	\$30,795
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	45	Bachelor's	0.83	\$35,585
25-2022	Middle School Teachers, Except Special and Career/Technical Education	40	Bachelor's	0.5	\$38,914
11-3031	Financial Managers	40	Bachelor's	4	\$39,534
11-3051	Industrial Production Managers	30	Bachelor's	3.5	\$57,466
43-5061	Production, Planning, and Expediting Clerks	20	High school diploma	0.53	\$29,043
21-1022	Healthcare Social Workers	20	Master's	1	\$33,049
49-9043	Maintenance Workers, Machinery	20	High school diploma	0.8	\$29,243

## Appendix C: Wage Data by CIP Code and Degree Level

The tables below are limited to CIP codes with at least 5 graduates employed from that CIP and at that degree level. Wage data displays wages earned 2 quarters after certificate or degree receipt.

**Table C-1: Top 10 Income Earners by CIP Code, Certificates**

### Certificates

Programs of Study Titles	CIP Code	CIP Title	Average Wage (K) * 4 Qtrs
Engineering Technology	150303	Electrical, Electronic and Communications Engineering Techno	\$63,244.60
Ultrasonic Technician	510910	Diagnostic Medical Sonography/Sonographer and Ultrasound Tec	\$59,844.44
Network Systems	111003	Computer and Information Systems Security.	\$56,735.44
Engineering Technology	150000	Engineering Technology, General.	\$52,983.80
Medical Imaging- Radiography	510920	Magnetic Resonance Imaging (MRI) Technology/Technician.	\$51,778.64
Fire Fighting	430203	Fire Science/Fire-fighting.	\$50,762.44
Prod. Design, Ops, and Maint. Path -- Operations & Maint.	520205	Operations Management and Supervision.	\$45,397.24
Engineering Technology	150613	Manufacturing Technology/Technician.	\$44,393.64
Cardiovascular Technologists and Technicians	510901	Cardiovascular Technology/Technologist.	\$44,007.32
Engineering Technology	150612	Industrial Technology/Technician.	\$43,924.68

**Table C-2: Top 10 Income Earners by CIP Code, Associates**

### Associates

Programs of Study Titles	CIP Code	CIP Title	Average Wage (K) * 4 Qtrs
Prod. Design, Ops, and Maint. Path -- Operations & Maint.	470303	Industrial Mechanics and Maintenance Technology.	\$64,948.44
Fire Fighting	430203	Fire Science/Fire-fighting.	\$53,160.12
Nursing (RN)	513801	Registered Nursing/Registered Nurse.	\$50,662.88
Industrial Hygiene	512202	Environmental Health.	\$49,094.76
Engineering Technology	150000	Engineering Technology, General.	\$45,592.84

Business Management	520299	Business Administration, Management and Operations, Other.	\$43,404.16
Technical Design & Preconstruction	150101	Architectural Engineering Technology/Technician.	\$42,210.04
Prod. Design, Ops, and Maint. Path -- Operations & Maint.	150403	Electromechanical Technology/Electromechanical Engineering T	\$41,092.84
Network Systems	110901	Computer Systems Networking and Telecommunications.	\$40,203.92
Respiratory Therapy	510908	Respiratory Care Therapy/Therapist.	\$40,046.20

**Table C-3: Top 10 Income Earners by CIP Code, Bachelor's Bachelors**

Programs of Study Titles	CIP Code	CIP Title	Average Wage (K) * 4 Qtrs
Nurse Practitioners	513818	Nursing Practice.	\$69,945.56
Web/Multimedia Management, Programming	140903	Computer Software Engineering.	\$62,232.92
Electrical/Computer Engineering	141001	Electrical, Electronics and Communications Engineering.	\$60,570.80
Industrial Engineering	143501	Industrial Engineering.	\$56,185.72
Civil Engineering	140801	Civil Engineering, General.	\$54,378.24
Electrical/Computer Engineering	144201	Mechatronics, Robotics, and Automation Engineering.	\$54,359.32
Electrical/Computer Engineering	140901	Computer Engineering, General.	\$53,000.16
All Other Engineers	140101	Engineering, General.	\$51,811.04
Nursing (RN)	513801	Registered Nursing/Registered Nurse.	\$50,362.92
Nuclear Engineering	142301	Nuclear Engineering.	\$50,187.76