Clovis Community College

Economic Overview and Program Gap Analysis

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# Executive Summary

Clovis College (RC) is located in the city of Clovis and serves four counties in central California. This report outlines the economy of this four-county region (Fresno, Kings, Madera, and Tulare Counties) and provides a “gap” analysis to determine how well the college’s program offerings are satisfying regional workforce demand. The report also offers recommendations for new program development. The following are some of the key findings of the analysis:

## Overview of Regional Economy

* The economy of the region served by CC (“the CC Economic Region”) is primarily driven by the Government; Agriculture, Forestry, Fishing, & Hunting; and Health Care & Social Assistance industries. The Agriculture, Forestry, Fishing, & Hunting and Health Care & Social Assistance sectors added new jobs between 2009 and 2014, but of the top three industries only the Health Care & Social Assistance and Government sectors are projected to grow through 2024. Management of Companies & Enterprises and Agriculture, Forestry, Fishing, & Hunting are projected to lose jobs over the next decade. Overall the regional job growth is expected to be 13% over the next decade.
* Some high-skill occupational categories are projected to see high job growth over the next ten years, including healthcare practitioners & technical occupations (21% job growth), computer & mathematical occupations (20% job growth), and architecture & engineering occupations (12% job growth).
* Between 2014 and 2024, the highest number of average annual job openings for workers with postsecondary certificates and above are projected to occur within office & administrative support occupations; sales & related occupations; and education, training, & library occupations.
* Around 21% of residents in the area commute outside the RC Economic Region for work and roughly 18% of the RC Economic Region workers reside outside the area, indicating that there are economic links between the RC Economic Region and the surrounding communities for both out-commuters and in-commuters.
* The educational composition of the adult population in the RC Economic Region (people age 25 and older) has seen a small shift in recent years. Between 2009 and 2014, the proportion of adults with less than a high school diploma increased by 2.7 percentage points and the proportion with a high school diploma decreased by 1.3 percentage points. Meanwhile, the proportion of adults with other levels of education decreased slightly in the past five years; notably those with some college and bachelor’s degree levels (decreased by 0.6 and 0.4 percentage points, respectively).

## Program Gap Analysis

* Between both levels of postsecondary certificate and associate’s degree, there are a total of 12 programs associated with significant workforce gaps.
* General Office Occupations & Clerical Services has the largest certificate level gap (gap of 645), but compensation from related occupations is relatively low (median hourly earnings $13.89). Accounting has the second largest certificate level gap (gap of 110; median hourly wage $16.67). Child Development/Early Care & Education, the third largest certificate level gap, has a significant gap but is mapped to lower paying occupations (gap of 90, median hourly earnings $9.90).
* The three largest associate’s degree level gaps are: General Office Occupations & Clerical Services (gap of 669; median hourly earnings $13.89), Child Development (gap of 72; median hourly earnings $9.90), and Early Care & Education (gap of 32; median hourly earnings $19.58). Some of these same programs have gaps at the certificate level and associate’s degree level.
* Licensed Vocational Nursing (surplus 182), Dental Assistant (surplus 182), and Child Development/Early Care & Education (surplus 114) are the three programs associated with the largest surpluses of completers at the certificate level.
* Nursing (surplus of 511), General Social Sciences (surplus of 244), and Administration of Justice (surplus of 176) are top three associate’s degree level surpluses.
* For some of the programs, RC is producing a moderate number of new completers, but additional supply from other regional institutions leads to the surplus. It is possible that some of the completers are seeking employment outside the RC Economic Region.
* There are 17 postsecondary certificate level areas of opportunity identified. Wage rates are in a range between $12.27 for farmworkers, farm, ranch, & aquacultural animals to a high of $39.62 for electrical power-line installers & repairers.
* The largest gaps in the programmatic areas of opportunity were for blue collar occupations like heavy & tractor-trailer truck drivers, general maintenance & repair workers, and industrial truck & tractor operators appear to be undersupplied in the RC Economic Region. Some skilled trades are also among the top areas of opportunity: electricians and carpenters.
* An additional four areas of opportunity are at the associate’s degree level. Medical & clinical laboratory technicians have the largest gap (gap of 10), but pay only $16.93 an hour. Other healthcare related occupations, diagnostic medical sonographers and medical equipment repairers, have small gaps but high wages (gap of 8 each; median hourly earnings over $20 an hour).

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# Introduction

Colleges face many challenges in their efforts to identify the training needs of their Economic Regions. They must account for regional economic trends and the changing quality of the workforce. Furthermore, as technology progresses, colleges need to address the increasingly complex and specialized skills required by employers. In light of these dynamics, an understanding of the regional economy and the demand for skilled labor is vital to the planning efforts of colleges seeking to adapt their program offerings to the requirements of an ever-changing workforce.

To gain better insight into economic conditions and workforce trends, Clovis Community College (CCC) partnered with Economic Modeling Specialists Intl. (EMSI) to conduct an economic overview of the college’s Economic Region and a workforce “gap” analysis of the college’s program offerings. Gap analysis is a technique used to assess the supply and demand of skilled workers and identify the educational programs that need to be adapted in order to fill any existing or future gaps. The analysis weighs the educational output of RC and other regional institutions against the number of job openings related to the institutions’ program offerings to determine whether an oversupply or an undersupply of skilled workers exists. The goal of the analysis is to provide RC with relevant data and information that it can use when solving problems and making decisions about current and future program development.

The regional backdrop used in this report is defined by Fresno, Kings, Madera, and Tulare Counties. This regional backdrop will be referred to as “the RC Economic Region”. CCC is located in Fresno, CA.[[1]](#footnote-1) See Figure 1.1 for a map of the region.

The report is broken into two chapters. Chapter 1 provides an overview of employment in the CCC Economic Region economy with high-level information about current and projected job trends, resident commuting patterns, and unemployment. Chapter 1 also provides further information specifically related to the educational characteristics of the population by gender and ethnicity. Chapter 2 summarizes the results of the program gap analysis and provides recommendations for possible future program needs. After a brief conclusion, detailed information and data are provided in the appendices.

# Chapter 1: Overview of the Economy

This chapter provides a high-level overview of employment and demographics in the economy of the CCC Economic Region, defined by Fresno, Kings, Madera, and Tulare Counties (see Figure 1.1). The goal of the chapter is to provide data on the economic and workforce employment trends that either already exist or are developing in the region. Such information is crucial in building awareness of the region’s labor force – both now and in the future – and identifying priority areas where educators can focus their attention. The chapter examines employment and demographics in the CCC Economic Region according to the following five indicators: jobs by industry, jobs by occupation, commuting patterns, unemployment, and educational attainment.

Figure 1.1: Map of CCC Economic Region



## Jobs by Industry

Evaluating current and future employment by industry provides information on the economic diversification of a given region. Industries consist of groups of companies that are primarily engaged in producing the same product or service. The North American Industry Classification System (NAICS) is the structure used by the U.S. Census Bureau to classify establishments into industries based on their production process (although the final product or service is usually similar for the firms in a given industry). NAICS applies a six-digit hierarchical coding system to organize more than 1,100 detailed industries into twenty larger industry sectors. The breakdown of current and future employment by major industry sector in the CCC Economic Region appears in Table 1.1 and Figure 1.2.

As shown, the three largest industry sectors in the CCC Economic Region are Government; Agriculture, Forestry, Fishing, & Hunting; and Health Care & Social Assistance. Together these sectors made up 319,508 jobs or approximately 48% of total regional employment in 2014. The Agriculture, Forestry, Fishing, & Hunting and Health Care & Social Assistance sectors added new jobs between 2009 and 2014 but the Health Care & Social Assistance and Government sectors are projected to grow through 2024. Other industry sectors with notable projected growth are Administrative & Support & Waste Management & Remediation Services (+12,064 jobs), Retail Trade (+11,348 jobs), and Accommodation & Food Services (+8,366 jobs). The industry sectors that are expected to contract between 2014 and 2024 are Management of Companies & Enterprises (-1,469 jobs) and Agriculture, Forestry, Fishing, & Hunting (-488jobs).

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| **Table 1.1: Current and Projected Jobs and Job Change by Industry Sector, 2014 to 2024** |
| NAICS Code | Description | 2014 Jobs | 2024 Jobs | Change | % Change |
| 11 | Agriculture, Forestry, Fishing and Hunting | 109,735 | 109,247 | (488) |  (0%) |
| 21 | Mining, Quarrying, and Oil and Gas Extraction | 343 | 406 | 63  | 18% |
| 22 | Utilities | 2,955 | 3,363 | 408  | 14% |
| 23 | Construction | 26,694 | 30,908 | 4,214  | 16% |
| 31 | Manufacturing | 42,572 | 45,552 | 2,980  | 7% |
| 42 | Wholesale Trade | 20,234 | 24,070 | 3,836  | 19% |
| 44 | Retail Trade | 65,776 | 77,124 | 11,348  | 17% |
| 48 | Transportation and Warehousing | 20,688 | 24,084 | 3,396  | 16% |
| 51 | Information | 5,565 | 5,954 | 389  | 7% |
| 52 | Finance and Insurance | 13,963 | 14,938 | 975  | 7% |
| 53 | Real Estate and Rental and Leasing | 8,321 | 8,989 | 668  | 8% |
| 54 | Professional, Scientific, and Technical Services | 17,984 | 21,478 | 3,494  | 19% |
| 55 | Management of Companies and Enterprises | 3,373 | 1,904 | (1,469) |  (44%) |
| 56 | Administrative and Support and Waste Management and Remediation Services | 39,064 | 51,128 | 12,064  | 31% |
| 61 | Educational Services | 7,772 | 10,010 | 2,238  | 29% |
| 62 | Health Care and Social Assistance | 83,778 | 104,960 | 21,182  | 25% |
| 71 | Arts, Entertainment, and Recreation | 6,228 | 6,651 | 423  | 7% |
| 72 | Accommodation and Food Services | 42,639 | 51,005 | 8,366  | 20% |
| 81 | Other Services (except Public Administration) | 28,547 | 31,964 | 3,417  | 12% |
| 90 | Government | 125,995 | 133,469 | 7,474  | 6% |
|   | Total | 672,227 | 757,205 | 84,978 | 13% |
| Source: EMSI Complete Data 2014.3 |

Figure 1.2: Jobs and Job Change by Industry Sector in CCC Economic Region, 2014 to 2024

Source: EMSI Complete Data 2014.3

Table 1.2 shows the employment concentration of the industry sectors in the CCC Economic Region, measured in terms of location quotients (LQs). LQs are used to assess national competitiveness by comparing the concentration of employment in a given industry against the concentration of employment for that same industry across the nation. An LQ equal to 1 means that the percentage of total employment comprised by an industry in the region exactly matches the percentage of total employment comprised by that industry in the nation. An LQ greater than 1 means that the industry comprises a greater proportion of total employment in the region than it does in the nation.

High LQs (usually anything greater than 1.2) are an indication that the region has a comparative advantage or specialization in certain industries relative to the rest of the nation, or potentially to other competing regions. When evaluated jointly with job counts and expected job growth, high LQs give a sense of the industry sectors that have the greatest potential for workforce investment and where regional economic development professionals are likely to be focusing their efforts. This information is of particular importance to educators seeking to engage in larger conversations with other organizations about aligning program offerings with workforce needs.

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| **Table 1.2: employment Concentration by industry sector in CCC Economic Region, 2014 and 2024** |
| NAICS Code | Description | 2014 Location Quotient | 2024 Location Quotient |
| 11 | Agriculture, Forestry, Fishing and Hunting | 13.28 | 13.39 |
| 21 | Mining, Quarrying, and Oil and Gas Extraction | 0.09 | 0.09 |
| 22 | Utilities | 1.22 | 1.38 |
| 23 | Construction | 0.77 | 0.79 |
| 31 | Manufacturing | 0.79 | 0.83 |
| 42 | Wholesale Trade | 0.76 | 0.81 |
| 44 | Retail Trade | 0.93 | 1.00 |
| 48 | Transportation and Warehousing | 0.95 | 0.98 |
| 51 | Information | 0.45 | 0.46 |
| 52 | Finance and Insurance | 0.51 | 0.50 |
| 53 | Real Estate and Rental and Leasing | 0.75 | 0.76 |
| 54 | Professional, Scientific, and Technical Services | 0.43 | 0.42 |
| 55 | Management of Companies and Enterprises | 0.36 | 0.18 |
| 56 | Administrative and Support and Waste Management and Remediation Services | 0.92 | 1.01 |
| 61 | Educational Services | 0.46 | 0.49 |
| 62 | Health Care and Social Assistance | 1.00 | 1.02 |
| 71 | Arts, Entertainment, and Recreation | 0.56 | 0.52 |
| 72 | Accommodation and Food Services | 0.76 | 0.80 |
| 81 | Other Services (except Public Administration) | 0.89 | 0.89 |
| 90 | Government | 1.19 | 1.18 |
| Source: EMSI Complete Data 2014.3 |

The following three industry sectors have the highest location quotients in the CCC Economic Region: Agriculture, Forestry, Fishing, & Hunting (13.28); Utilities (1.22); and Government (1.19). The Agriculture, Forestry, Fishing, & Hunting and Utilities industry sectors are considered to have a comparative advantage. The relative concentrations are expected to undergo some changes over the next decade, yet the same industry sectors are expected to be above the 1.2 cutoff.[[2]](#footnote-2)

## Jobs by Occupation

Researchers often refer to industry data to get a sense of regional economic trends, but in order to better understand the quality of the jobs contained within that region, some knowledge of occupations is needed. This is because the earning levels and education requirements of workers bear more of a relationship to their occupation than to the industry in which they work. For example, the Manufacturing industry – while employing a number of assemblers and machine operators – also employs people in management occupations and in professional occupations such as engineering. All of these occupations have different pay scales and require varying levels of education and training.

Federal agencies use the Standard Occupational Classification (SOC) system to classify workers into occupational categories based on work performed. The 2010 SOC system contains more than 800 detailed occupations organized according to a five-digit hierarchical coding structure. Detailed occupations with similar job duties are further combined to form 23 major groups. Table 1.3 shows the breakdown of employment in the CCC Economic Region by major group, with information on current and projected jobs, job change, average annual openings, and wage rates.

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| **Table 1.3: CUrrent and Projected Jobs, job change, and median hourly earnings by Major Occupation Group IN CCC ECONOMIC REGION, 2014 to 2024** |
| SOC Code | Description | 2014 Jobs | 2024 Jobs | Change | % Change | Median Hourly Earnings | Average Annual Openings |
| 11-0000 | Management  | 34,033 | 35,509 | 1,479  | 4% | $33.44 | 805 |
| 13-0000 | Business and Financial Operations  | 21,122 | 23,536 | 2,412  | 11% | $27.50 | 657 |
| 15-0000 | Computer and Mathematical  | 5,405 | 6,506 | 1,102  | 20% | $31.17 | 196 |
| 17-0000 | ACCChitecture and Engineering  | 5,034 | 5,660 | 629  | 12% | $37.13 | 175 |
| 19-0000 | Life, Physical, and Social Science  | 5,372 | 5,995 | 602  | 11% | $29.29 | 216 |
| 21-0000 | Community and Social Service  | 14,172 | 16,376 | 2,200  | 16% | $21.05 | 518 |
| 23-0000 | Legal  | 3,605 | 4,072 | 468  | 13% | $37.16 | 107 |
| 25-0000 | Education, Training, and Library  | 44,176 | 49,596 | 5,424  | 12% | $23.84 | 1,399 |
| 27-0000 | Arts, Design, Entertainment, Sports, and Media  | 6,647 | 7,396 | 750  | 11% | $16.91 | 216 |
| 29-0000 | Healthcare Practitioners and Technical  | 31,824 | 38,547 | 6,723  | 21% | $39.22 | 1,280 |
| 31-0000 | Healthcare Support  | 16,010 | 20,037 | 4,032  | 25% | $12.99 | 446 |
| 33-0000 | Protective Service  | 18,698 | 20,752 | 2,042  | 11% | $28.47 | 512 |
| 35-0000 | Food Preparation and Serving Related  | 45,785 | 54,406 | 8,621  | 19% | $9.70 | 1,014 |
| 37-0000 | Building and Grounds Cleaning and Maintenance  | 24,967 | 28,700 | 3,733  | 15% | $11.15 | 263 |
| 39-0000 | Personal Care and Service  | 24,501 | 29,342 | 4,856  | 20% | $9.73 | 572 |
| 41-0000 | Sales and Related  | 60,828 | 70,148 | 9,319  | 15% | $13.88 | 1,841 |
| 43-0000 | Office and Administrative Support  | 89,685 | 100,229 | 10,552  | 12% | $15.53 | 2,037 |
| 45-0000 | Farming, Fishing, and Forestry  | 84,209 | 85,088 | 881  | 1% | $9.32 | 491 |
| 47-0000 | Construction and Extraction  | 21,896 | 24,869 | 2,977  | 14% | $18.99 | 262 |
| 49-0000 | Installation, Maintenance, and Repair  | 24,002 | 28,205 | 4,202  | 18% | $19.66 | 490 |
| 51-0000 | Production  | 32,364 | 36,691 | 4,338  | 13% | $14.17 | 410 |
| 53-0000 | Transportation and Material Moving  | 50,817 | 59,168 | 8,347  | 16% | $13.51 | 693 |
| SouCCCe: EMSI Complete Data 2014.3 |

Office & administrative support occupations comprise the largest occupation group in the CCC Economic Region at 89,685 jobs, followed by farming, fishing, & forestry occupations at 84,209 jobs. Neither of these occupation groups ranks among the highest paid, however. Healthcare practitioners & technical occupations have median earnings of $39.22 an hour, the highest on the regional pay scale. Legal occupations – while the smallest occupation group – have median earnings of $37.16 an hour, ranking second highest on the regional pay scale. Several of the higher-paying occupation groups are also projected to experience job growth over the next ten years, such as healthcare practitioners & technical services occupations (21%) and computer & mathematical occupations (20%).

Figure 1.3 provides a look at the average annual job openings for workers with some college or above by occupation group. Job openings refer to new jobs due to growth plus replacement jobs due to worker turnover. Between 2014 and 2024, the occupations with the highest number of average annual job openings for workers with some college or above occurs in office & administrative support occupations; sales & related occupations; and education, training, & library occupations.

Figure 1.3: Average Annual Openings between 2014 and 2024 for Workers with Some College and Above by Occupation Group in the CCC Economic Region

SouCCCe: EMSI Complete Data 2014.3

## Commuting Patterns

The Longitudinal Employer-Household Dynamics (LEHD) program[[3]](#footnote-3) at the U.S. Census Bureau provides information on the residential and employment locations of workers. “Jobs by place of work” refers to where residents of the region commute to work, and “Jobs by place of residence” refers to where workers in the region live. Data for the CCC Economic Region appears in Tables 1.4 and 1.5, with the same information displayed in Figures 1.4 and 1.5.

Approximately 20.9% of residents commute outside the CCC Economic Region for work, indicating that there are economic links between the county and surrounding communities. Nearly half of the residents work in Fresno County (47.6%), and a significant portion of residents work in Tulare County (19.8%). Table 1.4 and Figure 1.4 display the top ten employment counties for CCC Economic Region residents.

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| **Table 1.4: Jobs by PLace of work** |
| County | Jobs | Commute Share |
| Fresno County | 245,822 | 47.6% |
| Tulare County | 102,408 | 19.8% |
| Kings County | 30,429 | 5.9% |
| Madera County | 29,928 | 5.8% |
| Los Angeles County | 15,690 | 3.0% |
| Kern County | 15,011 | 2.9% |
| Sacramento County | 8,662 | 1.7% |
| Santa Clara County | 6,721 | 1.3% |
| MeCCCed County | 5,359 | 1.0% |
| Stanislaus County | 5,197 | 1.0% |
| All Other Locations | 51,360 | 9.9% |
| SouCCCe: Census LEHD |

Figure 1.4: Jobs by Place of Work

 

Table 1.5 and Figure 1.5 display the top ten counties by place of residency. Of the people who work in the CCC Economic Region, 82.1% also live in the region. Almost half of the residents in the region live in Fresno County (49.1%). Los Angeles County supplies the most commuters from outside the area at 2.6%.

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| **Table 1.5: Jobs by place of Residence** |
| County | Count | Commute Share |
| Fresno County | 244,487 | 49.1% |
| Tulare County | 102,305 | 20.6% |
| Madera County | 31,303 | 6.3% |
| Kings County | 30,492 | 6.1% |
| Los Angeles County | 12,963 | 2.6% |
| Kern County | 12,171 | 2.4% |
| Merced County | 6,290 | 1.3% |
| Santa Clara County | 4,497 | 0.9% |
| Stanislaus County | 4,411 | 0.9% |
| Sacramento County | 4,158 | 0.8% |
| All Other Locations | 44,746 | 9.0% |
| Source: Census LEHD |  |  |

Figure 1.5: Jobs by Place of Residence

 

Figure 1.6 presents the inflow and outflow of jobs to and from the CCC Economic Region. There are 497,823 jobs in the region with 408,587 of these jobs filled by residents and 89,236 jobs going to people living outside the region. Additionally, 108,000 residents commute outside the region for work. The figure clearly illustrates the fact that more workers out-commute than in-commute.

**Figure 1.6 In-flow/Out-flow Job Count**





## Unemployment

Data on unemployment give researchers an idea of where skills mismatches may exist in the region. Unemployment data can also provide important context when identifying the training programs that are best suited to transitioning unemployed workers into in-demand occupations.

Table 1.6 and Figure 1.7 present the number of people unemployed by industry sector in the CCC Economic Region. Data reflect May 2014 and follow the same methodology used by the federal statistical agencies to determine the number of workers in an industry that are not currently employed. The unemployment rate is not provided because it is difficult to accurately determine the size of the labor force in a given industry on a monthly basis. Rather than the unemployment rate, the percent of all unemployed for the region and for the nation are provided to display which industry sectors have the highest concentration of unemployed workers.

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| **Table 1.6: Number of Unemployed Workers by Industry Sector in CCC Economic Region** |
| NAICS Code | Description | No. of Unemployed | % of Unemployed | National% of Unemployed |
| 11 | Agriculture, Forestry, Fishing and Hunting | 21,212 | 25% | 1% |
| 21 | Mining, Quarrying, and Oil and Gas Extraction | 13 | 0% | 1% |
| 22 | Utilities | 420 | 0% | 0% |
| 23 | Construction | 4,488 | 5% | 8% |
| 31 | Manufacturing | 6,804 | 8% | 9% |
| 42 | Wholesale Trade | 154 | 0% | 2% |
| 44 | Retail Trade | 8,310 | 10% | 12% |
| 48 | Transportation and Warehousing | 2,135 | 2% | 3% |
| 51 | Information | 1,133 | 1% | 2% |
| 52 | Finance and Insurance | 995 | 1% | 3% |
| 53 | Real Estate and Rental and Leasing | 488 | 1% | 1% |
| 54 | Professional, Scientific, and Technical Services | 459 | 1% | 4% |
| 55 | Management of Companies and Enterprises | 1 | 0% | 0% |
| 56 | Administrative and Support and Waste Management and Remediation Services | 6,615 | 8% | 8% |
| 61 | Educational Services (Private) | 619 | 1% | 2% |
| 62 | Health Care and Social Assistance | 4,679 | 5% | 7% |
| 71 | Arts, Entertainment, and Recreation | 734 | 1% | 2% |
| 72 | Accommodation and Food Services | 4,289 | 5% | 9% |
| 81 | Other Services (except Public Administration) | 2,981 | 3% | 4% |
| 90 | Government | 3,577 | 4% | 7% |
| 99 | No Previous Work Experience/Unspecified | 15,312 | 18% | 15% |
| Source: EMSI Total Unemployment (5/2014) |

As shown in Table 1.6, the category with the highest number of unemployed is in Agriculture, Forestry, Fishing, & Hunting. The second highest number of unemployed is in a non-industry labeled as “No Previous Work Experience/Unspecified.” This is simply a catch-all category for which reliable unemployment data are unavailable. The Retail Trade sector has the third highest number of unemployed. It is common for industries like Retail Trade and Administrative & Support & Waste Management & Remediation Services to have a high percentage of low-skill jobs that require little to no education and training, thus making them more vulnerable to worker turnover. Another sector that is generally affected by high turnover is Accommodation & Food Services. For industry sectors such as Construction, seasonal jobs or jobs of short duration may also lead to high numbers of unemployed workers.

Only two industry sectors in the CCC Economic Region exceed the national concentration of unemployed workers. In the CCC Economic Region, Agriculture, Forestry, Fishing, & Hunting and No Previous Work Experience/Unspecified have a much higher proportion of unemployed workers than at the national level. On the other hand, Accommodation & Food Services and Construction actually have a lower proportion of unemployed workers than at the national level in the CCC Economic Region.

Figure 1.7: Number of Unemployed Workers by Industry Sector in CCC Economic Region

Source: EMSI Total Unemployment (5/2014)

Table 1.7 and Figure 1.8 provide a breakdown of unemployment in the CCC Economic Region by major occupation group. As shown, occupational groups that contain the highest number of unemployed workers are farming, fishing, & forestry occupations (16,866 unemployed workers), sales & related occupations (15,608 unemployed workers), no previous work experience/unspecified occupations (10,988 unemployed workers). Though some of these occupations groups have a relatively high number of annual openings (see Figure 1.3), high turnover still leads to a high number of unemployed.

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| **Table 1.7: Number of Unemployed Workers by Occupation Group in CCC Economic Region**  |
| SOC Code | Description | No. of Unemployed | % of Unemployed | National% of Unemployed |
| 11-0000 | Management | 2,401 | 3% | 5% |
| 13-0000 | Business and Financial Operations | 1,039 | 1% | 3% |
| 15-0000 | Computer and Mathematical | 766 | 1% | 1% |
| 17-0000 | ACCChitecture and Engineering | 233 | 0% | 1% |
| 19-0000 | Life, Physical, and Social Science | 4 | 0% | 0% |
| 21-0000 | Community and Social Service | 571 | 1% | 1% |
| 23-0000 | Legal | 200 | 0% | 1% |
| 25-0000 | Education, Training, and Library | 19 | 0% | 2% |
| 27-0000 | Arts, Design, Entertainment, Sports, and Media | 499 | 1% | 2% |
| 29-0000 | Healthcare Practitioners and Technical | 872 | 1% | 2% |
| 31-0000 | Healthcare Support | 1,067 | 1% | 2% |
| 33-0000 | Protective Service | 776 | 1% | 1% |
| 35-0000 | Food Preparation and Serving Related | 9,607 | 11% | 8% |
| 37-0000 | Building and Grounds Cleaning and Maintenance | 2,666 | 3% | 5% |
| 39-0000 | Personal Care and Service | 24 | 0% | 3% |
| 41-0000 | Sales and Related | 15,608 | 18% | 11% |
| 43-0000 | Office and Administrative Support | 6,373 | 7% | 14% |
| 45-0000 | Farming, Fishing, and Forestry | 16,866 | 20% | 1% |
| 47-0000 | Construction and Extraction | 53 | 0% | 8% |
| 49-0000 | Installation, Maintenance, and Repair | 1,150 | 1% | 2% |
| 51-0000 | Production | 9,194 | 11% | 6% |
| 53-0000 | Transportation and Material Moving | 4,439 | 5% | 8% |
| 99-0000 | No Previous Work Experience/Unspecified | 10,988 | 13% | 11% |
| SouCCCe: EMSI Total Unemployment (5/2014) |

Most of the occupation groups have a concentration of unemployed workers that is either at or below the national average, including construction & extraction occupations, office & administrative support occupations, and transportation & material moving occupations. Farming, fishing, & forestry occupations and food preparation & serving related occupations have a much higher concentration of unemployed than at the national level.

Figure 1.8: Number of Unemployed Workers by Occupation Group in CCC Economic Region

SouCCCe: EMSI Total Unemployment (5/2014)

## Educational Attainment

This section describes the educational attainment of the population in the CCC Economic Region for adults aged 25 years and older. This information is useful for educators targeting specific population groups that have low education levels. Educational attainment data in this section are presented by gender and by ethnicity and are broken out according to the following categories: 1) less than a high school degree, 2) high school degree, 3) some college,[[4]](#footnote-4) 4) associate’s degree, 5) bachelor’s degree, and 6) graduate degree and higher.

### Overall Educational Attainment

Table 1.8 and Figure 1.9 display the educational attainment of the overall adult population in the CCC Economic Region, without reference to gender and ethnicity. In the CCC Economic Region, the percentage of the adult population with a high school diploma or less is 54%, which is higher than the national average of 44%. These data suggest there is still an opportunity for educators in the CCC Economic Region to boost the percentage of adults with an associate’s degree or higher (currently this percentage sits at 24% for the region overall). Out of all the education categories in Table 1.8, the people that are most likely to seek education and training from CCC are those in the “Less than high school diploma,” “High school diploma,” and “Some college” categories. Together these categories total 795,321 people, or 76% of the entire adult population in the region. Between 2009 and 2014, the proportion of the overall adult population with “Less than a high school diploma” increased by 2.7 percentage points and the proportion of adults with a “High school diploma” decreased by 1.3 percentage points.[[5]](#footnote-5) Meanwhile, the proportion of adults with “Some college,” “Associate’s degree,” “Bachelor’s degree,” or a “Graduate degree and higher” decreased slightly (0.6 percentage points, 0.2 percentage points, 0.4 percentage points, and 0.3 percentage points, respectively).

|  |
| --- |
| **Table 1.8: Breakdown of Adult PopUlation in the CCC Economic Region by Educational Attainment, 2009 and 2014**  |
| Education Level | 2009 Population | 2009 % Distribution | 2014 Population | 2014 % Distribution | Population change | % Distribution Change |
| Less than HS diploma or equivalent | 281,261 | 29% | 332,098 | 32% | 50,837  | 2.7% |
| High school diploma or equivalent | 226,864 | 23% | 231,538 | 22% | 4,674  |  (1.3%) |
| Some college | 220,989 | 23% | 231,684 | 22% | 10,695  |  (0.6%) |
| Associate's degree | 75,152 | 8% | 79,500 | 8% | 4,347  |  (0.2%) |
| Bachelor's degree | 112,473 | 12% | 116,805 | 11% | 4,332  |  (0.4%) |
| Graduate degree or higher | 52,108 | 5% | 53,581 | 5% | 1,473  |  (0.3%) |
| SouCCCe: EMSI Complete Data 2014.3 |

Figure 1.9: Educational Attainment of Adult Population in the CCC Economic Region

### Educational Attainment by Gender

The distribution of educational attainment by gender is fairly even in the CCC Economic Region. Males are slightly more likely to have “Less than high school diploma” level of education while females are more likely to have “Some college,” “Associate’s degree,” or “Bachelor’s degree” levels. This information appears in Table 1.9 and Figure 1.10.

|  |
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| **Table 1.9: Breakdown of Adult Population in the CCC Economic Region by Educational Attainment and Gender** |
| Education Level | Males | Proportion | Females | Proportion |
| Less than high school diploma or equivalent | 176,163 | 34% | 155,935 | 30% |
| High school diploma or equivalent | 114,302 | 22% | 117,236 | 22% |
| Some college | 111,471 | 21% | 120,213 | 23% |
| Associate's degree | 36,944 | 7% | 42,555 | 8% |
| Bachelor's degree | 53,698 | 10% | 63,106 | 12% |
| Graduate degree and higher | 27,557 | 5% | 26,024 | 5% |
| Source: EMSI Complete Data 2014.3 |

Figure 1.10: Educational Attainment of Adult Population in the CCC Economic Region by Gender

### Educational Attainment by Ethnicity

Figure 1.11 and Table 1.10 display the educational attainment of the adult population by ethnicity. The “Asian, Non-Hispanics” ethnicity category has the highest percentage of adults with post-secondary degrees (43%). “Native Hawaiian or Pacific Islander, Non-Hispanic” category follows with 42%. The “Hispanic, All Types” category has the lowest levels of education attainment. For this group, only 12% of the adult population has a post-secondary degree and 71% has a high school diploma or less. While the region is largely “Hispanic, All Types”, there are many opportunities to increase educational attainment in other ethnic groups.

Figure 1.11: Educational Attainment of Adult Population in the CCC Economic Region by Ethnicity

|  |
| --- |
| **Table 1.10: Breakdown of Adult Population in the CCC Economic Region by Educational Attainment and Ethnicity** |
|  |  | < HS Diploma | HS Diploma | Some College | Associate’s Degree | Bachelor’s Degree | Graduate Degree and Higher |
| White, Non-Hispanic | Count | 44,083 | 99,625 | 116,559 | 41,235 | 68,323 | 35,211 |
| Percent | 11% | 25% | 29% | 10% | 17% | 9% |
| Black, Non-Hispanic | Count | 8,929 | 11,607 | 12,114 | 3,572 | 3,981 | 2,039 |
| Percent | 21% | 27% | 29% | 8% | 9% | 5% |
| American Indian or Alaskan Native, Non-Hispanic | Count | 2,728 | 2,187 | 1,892 | 401 | 655 | 225 |
| Percent | 34% | 27% | 23% | 5% | 8% | 3% |
| Asian, Non-Hispanic | Count | 18,651 | 10,662 | 11,842 | 6,791 | 17,574 | 7,287 |
| Percent | 26% | 15% | 16% | 9% | 24% | 10% |
| Native Hawaiian or Pacific Islander, Non-Hispanic | Count | 190 | 313 | 231 | 55 | 423 | 68 |
| Percent | 15% | 24% | 18% | 4% | 33% | 5% |
| Two or More Races, Non-Hispanic | Count | 3,564 | 2,793 | 3,638 | 1,057 | 1,546 | 631 |
| Percent | 27% | 21% | 28% | 8% | 12% | 5% |
| Hispanic, All Types | Count | 253,953 | 104,352 | 85,409 | 26,389 | 24,303 | 8,122 |
| Percent | 51% | 21% | 17% | 5% | 5% | 2% |
| Source: EMSI Complete Data 2014.3 |

# Chapter 2: Program Gap Analysis

The results that appear in this chapter present a focused view of the program groups projected to have a regional gap or surplus. Programs are analyzed at two different levels: postsecondary vocational certifications and associate’s degrees, according to the training level offered at CCC.

Each table includes the TOP code and title,[[6]](#footnote-6) the average annual openings associated with that program (which have been de-duplicated using the process outlined in Appendix 3), the average annual completers between 2011 and 2013,[[7]](#footnote-7) and finally the gap or surplus figure. If the numbers are positive, there is a shortage or “gap” of completers—i.e., there are more job openings in those occupations than there are graduates or completers. If the numbers are negative, then there are fewer annual job openings compared to the “surplus” of completers for those program groups. The median hourly wage rate for related occupations is included. Due to data limitations, the wages are aggregated for all education levels.

## Interpreting Gap/Surplus Analysis Results

The gap analysisis intended to serve as a point of departure for CCC as the college discusses regional workforce needs. A surplus or deficit of workers in a particular category does not necessarily indicate a problem for the region, and it is important that each occupation group be evaluated on a case-by-case basis. Evaluation of the program supply (surplus and gaps) will provide an understanding of the role skilled occupations play in economic sustainability and growth.

Other information should also be considered when evaluating these surpluses and gaps. For example, only the education supply pipeline is considered in this analysis because these numbers can be tracked at the county and school level. However, other sources of supply exist as well—unemployed workers, industry trained pipelines, in-migrators, and job changers from other occupational categories can also be a source of skilled occupations. These types of considerations are useful when evaluating specific types of occupations. Unfortunately, secondary data sources (e.g., regional, state, and federal data) do not account for this, and primary data collection methods (i.e., interviews and surveys) are among the only ways to obtain information on this type of supply pipeline.

Lastly, it is important to keep in mind that the labor market is not so simple or efficient that one could expect supply and demand to be at perfect equilibrium for any extended period of time. As such, as a general rule of thumb, only programs with considerable gaps or surpluses should be considered long-term strategic issues worthy of closer examination. Given the size and characteristics of the CCC Economic Region, any gap or surplus within 20 jobs either above or below zero should be considered within the normal range of labor market fluctuations.

Once evaluated internally within the college, specific implications should be considered for programs with substantial surpluses or gaps. These implications include:

1. **Surplus:** Oversupply of specific education completers may lead to higher attrition rates (i.e., brain drain). In other words, the region is educating a workforce that is leaving after program completion because of a lack of jobs. Note: In the analysis of the CCC Economic Region where the neighboring population density is high in neighboring areas, a surplus of completers may indicate the need for Economic Region residents to commute outside of the Economic Region to find job opportunities. The commuting pattern flows described in Chapter 1 suggest that this is possible.
2. **Gap**: Undersupply of specific program completers may lead to missed opportunities for economic growth and put stress on local businesses to find necessary human capital elsewhere. In other words, the region’s education institutions are not providing the necessary workforce for the region, thereby shifting the burden on the industries to find workers in other economies to fill the needed occupations. This translates into higher human resources costs and decreased efficiencies in the economic system. This also provides an opportunity for institutions to develop new programs. Note: Given population density in the areas bordering the Economic Region, a completion gap may be filled by other institutions near the Economic Region. This potential scenario will need to be taken into consideration from the leadership.

## Postsecondary Certificate Level Gap Analysis

Figure 2.1 provides an illustration that summarizes the top gaps for CCC postsecondary certificate level programs. There were a total of seven gaps identified at this education level.

Figure 2.1: Supply and Demand for CCC Postsecondary Certificate Level Programs

Table 2.1 lists supply and demand for all certificate program types for which CCC offers a training program. While other program groups in the region may face larger surpluses, CCC did not offer any of the programs. Table 2.3 addresses programs that are not currently being offered but which would address considerable regional workforce gaps. At the certificate level, CCC is only one of many institutions offering programs and as such, their completers comprise 11% of total regional supply.

As shown in Table 2.1, General Office Occupations & Clerical Services has the largest gap. There are 725 annual openings but only 80 average annual completers (11 from CCC). Accounting (gap of 110; median hourly wage $16.67) and Child Development/Early Care & Education (gap of 90; median hourly wage $9.90) are the second and third largest gaps. It is important to keep wages in mind when reviewing the gap analysis. In the instance of the Child Development/Early Care & Education, there may be a large gap, but because the wages of occupations associated with this program are low, the returns to education may not be justified, and by extension, expanding the program may not be warranted.

There are often some programs preparing students for fields where they may compete with many other graduates. There are 12 programs at CCC that are training for occupations with a significant surplus of workers. Licensed Vocational Nursing has the top surplus of 182. Although CCC produces 64 completer a year for the 37 annual openings, other regional institutions add another 156 completers a year, resulting in the large surplus. Dental Assistant is tied for the largest surplus of 182 completers; followed by Child Development/Early Care & Education (surplus of 114). It is likely that the additional annual openings in areas outside of the CCC Economic Region are being filled by CCC completers. A review of placement rates could provide additional information.

Table 2.1: Supply and Demand for CCC Certificate Level Programs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TOP Code** | **TOP Title** | **Average Annual Openings** | **Average Annual Completers** | **Average Annual CCC Completers** | **Total Gap or Surplus** | **Median Hourly Wage** |
| ??? | General Office Occupations and Clerical Services | 725 | 80 | 11 | 645  |  $13.89  |
| 502.00 | Accounting (CIP 52.0302) | 196 | 86 | 17 | 110  |  $16.67  |
| 1305.00 | Child Development/Early Care and Education (CIP 19.0706) | 94 | 4 | 4 | 90  |  $9.90  |
| 505.00 | Business Administration (CIP 52.0201) | 270 | 191 | 5 | 79  |  $34.71  |
| 514.00 | Office Technology/Office Computer Applications | 185 | 125 | 35 | 60  |  $16.00  |
| 101.00 | Agriculture Technology and Sciences, General (CIP 1.0101) | 35 | 6 | 6 | 29  |  $19.25  |
| 502.00 | Accounting (CIP 52.0301) | 36 | 9 | 7 | 27  |  $26.45  |
| 958.00 | Water and Wastewater Technology | 19 | 3 | 0 | 16  |  $22.48  |
| 116.00 | Agricultural Power Equipment Technology (CIP 1.0205) | 29 | 13 | 13 | 16  |  $22.65  |
| 948.00 | Automotive Technology (CIP 47.0604) | 87 | 77 | 29 | 10  |  $15.72  |
| 950.00 | Aeronautical and Aviation Technology | 20 | 16 | 14 | 4  |  $24.53  |
| 835.00 | Physical Education | 3 | 3 | 3 | 0  |  $29.11  |
| 614.60 | Computer Graphics and Digital Imagery | 0 | 0 | 0 | (0) |  $24.81  |
| 505.00 | Business Administration (CIP 52.0299) | 3 | 4 | 4 | (1) |  $22.06  |
| 114.00 | Forestry (CIP 3.0599) | 0 | 2 | 2 | (1) |  $16.43  |
| 702.00 | Computer Information Systems | 2 | 4 | 2 | (2) |  $35.70  |
| 115.10 | Parks and Outdoor Recreation | 2 | 4 | 4 | (2) |  $10.75  |
| 114.00 | Forestry (CIP 3.0511) | 2 | 4 | 4 | (2) |  $14.25  |
| 501.00 | Business and Commence, General | 4 | 6 | 3 | (2) |  $36.61  |
| 103.00 | Plant Science (CIP 1.0304) | 27 | 29 | 26 | (2) |  $18.96  |
| 115.00 | Natural Resources | 1 | 4 | 4 | (3) |  $16.24  |
| 708.10 | Computer Networking | 9 | 14 | 1 | (5) |  $26.96  |
| 709.00 | World Wide Web Administration | 0 | 6 | 1 | (6) |  $29.82  |
| 614.10 | Multimedia | 0 | 6 | 1 | (6) |  $18.10  |
| 956.50 | Welding Technology | 35 | 43 | 19 | (8) |  $15.57  |
| 1030.00 | Graphic Art and Design | 5 | 13 | 7 | (8) |  $17.41  |
| 399.00 | Environmental Sciences and Technologies, Other | 1 | 9 | 9 | (8) |  $27.87  |
| 506.40 | Small Business and Entrepreneurship | 0 | 10 | 0 | (10) |  $29.33  |
| 1305.20 | Children with Special Needs | 1 | 11 | 0 | (10) |  $30.00  |
| 112.00 | Agriculture Business, Sales and Service | 29 | 40 | 39 | (11) |  $19.25  |
| 1230.00 | Nursing | 19 | 30 | 6 | (12) |  $37.13  |
| 701.00 | Information Technology, General | 8 | 22 | 10 | (14) |  $34.37  |
| 956.30 | Machining and Machine Tools | 44 | 58 | 36 | (14) |  $15.81  |
| 116.00 | Agricultural Power Equipment Technology (CIP 1.0299) | 2 | 21 | 21 | (19) |  $18.52  |
| 114.00 | Forestry (CIP 3.0501) | 10 | 32 | 30 | (22) |  $16.24  |
| 950.20 | Aviation Powerplant Mechanics | 8 | 31 | 31 | (23) |  $24.09  |
| 956.00 | Manufacturing and Industrial Technology | 4 | 34 | 11 | (30) |  $33.90  |
| 708.20 | Computer Support | 5 | 37 | 18 | (32) |  $23.08  |
| 614.30 | Website Design and Development | 5 | 58 | 0 | (53) |  $22.95  |
| 1201.00 | Health Occupations, General | 25 | 81 | 80 | (56) |  $11.55  |
| 2105.00 | Administration of Justice (CIP 43.0107) | 70 | 131 | 14 | (61) |  $32.10  |
| 514.20 | Medical Office Technology | 37 | 106 | 32 | (68) |  $14.95  |
| 116.00 | Agricultural Power Equipment Technology (CIP 1.0899) | 54 | 140 | 140 | (86) |  $19.93  |
| 1305.00 | Child Development/Early Care and Education (CIP 19.0709) | 165 | 279 | 65 | (114) |  $8.05  |
| 1240.10 | Dental Assistant | 14 | 196 | 24 | (182) |  $15.22  |
| 1230.20 | Licensed Vocational Nursing | 37 | 220 | 64 | (182) |  $22.84  |
| Source: EMSI Gap Analysis ModelNumbers may not sum due to rounding. |

## Associate’s Level Gap Analysis

Figure 2.2 below provides an illustration of the top gaps for CCC associate’s degree level programs. CCC had a total of five gaps greater than 20 at this education level.

Figure 2.2: Supply and Demand for CCC Associate’s Degree Level Programs

Similar to the previous table, Table 2.2 displays supply and demand for all associate’s level programs for which CCC provides training. Again, the table only includes program groups available at CCC. Other program groups in the region may face larger gaps, but CCC does not offer the program. Table 2.3 addresses programs that are not currently being offered but which would address considerable regional workforce gaps. CCC is once again only one of the many institutions offering associate’s degree level programs in the region, and as such, their completers comprise 8% of total regional supply.

Many of the programs that were training for undersupplied occupations at the certificate level are still undersupplied at the associate’s degree level. General Office Occupations & Clerical Services is the largest gap (gap of 669; median hourly earnings $13.89). The other four gaps at the associate’s degree level are: Child Development (gap of 72; median hourly earnings $9.90), Early Care & Education (gap of 32; median hourly earnings $19.58), General Agriculture Technology & Sciences (gap of 31; median hourly earnings $19.25), and Accounting (gap of 27; median hourly earnings $26.45).

For the CCC Economic Region, there are 13 fields with a significant surplus. The largest reported surplus is in Nursing. There are 110 annual openings compared to 621 regional completers (seven from CCC). General Social Sciences is associated with the second largest surplus (surplus of 244). Administration of Justice is the third largest surplus (surplus of 176). As alluded to earlier, it is highly likely that CCC completers are finding jobs outside the CCC Economic Region. A review of placement rates could provide additional information. Additionally, for some programs, completers may be intending to continue their education at a four year institution instead of immediately entering the workforce.

Table 2.2: Supply and Demand for CCC Associate’s Level Programs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TOP Code** | **TOP Title** | **Average Annual Openings** | **Average Annual Completers** | **Average Annual CCC Completers** | **Total Gap or Surplus** | **Median Hourly Wage** |
| ??? | General Office Occupations and Clerical Services | 761 | 92 | 5 | 669  |  $13.89  |
| 1305.00 | Child Development/Early Care and Education (CIP 19.0706) | 107 | 35 | 30 | 72  |  $9.90  |
| 1305.00 | Child Development/Early Care and Education (CIP 13.1210) | 35 | 3 | 1 | 32  |  $19.58  |
| 101.00 | Agriculture Technology and Sciences, General (CIP 1.0101) | 33 | 1 | 1 | 31  |  $19.25  |
| 502.00 | Accounting (CIP 52.0301) | 39 | 12 | 9 | 27  |  $26.45  |
| 956.30 | Machining and Machine Tools | 4 | 1 | 1 | 3  |  $15.81  |
| 102.00 | Animal Science | 6 | 3 | 1 | 3  |  $18.97  |
| 708.00 | Computer Infrastructure and Support | 3 | 1 | 1 | 2  |  $26.73  |
| 103.00 | Plant Science (CIP 1.0304) | 4 | 2 | 0 | 1  |  $18.96  |
| 948.00 | Automotive Technology (CIP 47.0699) | 3 | 3 | 3 | 0  |  $15.58  |
| 1004.00 | Music | 0 | 0 | 0 | (0) |  $15.64  |
| 956.00 | Manufacturing and Industrial Technology | 2 | 2 | 1 | (0) |  $33.90  |
| 1199.00 | Other Foreign Languages | 0 | 1 | 0 | (1) |  $17.29  |
| 103.00 | Plant Science (CIP 1.1299) | 0 | 1 | 1 | (1) |  $31.21  |
| 506.40 | Small Business and Entrepreneurship | 0 | 2 | 2 | (2) |  $29.33  |
| 1002.20 | Sculpture | 0 | 3 | 1 | (3) |  $8.12  |
| 1901.00 | Physical Sciences, General | 0 | 3 | 1 | (3) |  $48.95  |
| 956.50 | Welding Technology | 2 | 6 | 1 | (4) |  $15.57  |
| 1502.00 | Language Arts | 0 | 4 | 3 | (4) |  $28.92  |
| 3020.00 | Aviation and Airport Management and Services | 0 | 6 | 6 | (6) |  $37.13  |
| 835.00 | Physical Education | 1 | 7 | 7 | (6) |  $29.11  |
| 112.00 | Agriculture Business, Sales and Service | 3 | 13 | 10 | (9) |  $19.25  |
| 101.00 | Agriculture Technology and Sciences, General (CIP 1.0102) | 1 | 11 | 4 | (10) |  $27.42  |
| 114.00 | Forestry (CIP 3.0511) | 0 | 11 | 10 | (10) |  $14.25  |
| 1002.00 | Art (Painting, Drawing, and Sculpture) | 0 | 14 | 8 | (14) |  $14.62  |
| 514.20 | Medical Office Technology | 8 | 25 | 9 | (17) |  $14.95  |
| 1506.00 | Speech Communication | 1 | 35 | 7 | (34) |  $20.74  |
| 1230.20 | Licensed Vocational Nursing | 8 | 43 | 3 | (34) |  $22.84  |
| 505.00 | Business Administration (CIP 52.0201) | 130 | 173 | 23 | (43) |  $34.71  |
| 1701.00 | Mathematics, General | 0 | 61 | 22 | (61) |  $40.64  |
| 1240.20 | Dental Hygienist | 2 | 63 | 3 | (61) |  $39.81  |
| 1305.00 | Child Development/Early Care and Education (CIP 19.0709) | 22 | 105 | 1 | (83) |  $8.05  |
| 2105.00 | Administration of Justice (CIP 43.0103) | 5 | 121 | 6 | (116) |  $72.95  |
| 2001.00 | Psychology, General | 0 | 117 | 10 | (117) |  $41.21  |
| 2105.00 | Administration of Justice (CIP 43.0104) | 4 | 125 | 7 | (121) |  $72.95  |
| 401.00 | Biology, General | 0 | 163 | 88 | (163) |  $32.45  |
| 2105.00 | Administration of Justice (CIP 43.0107) | 24 | 200 | 3 | (176) |  $32.10  |
| 2201.00 | Social Sciences, General | 1 | 246 | 40 | (244) |  $25.96  |
| 1230.00 | Nursing | 110 | 621 | 7 | (511) |  $37.13  |
| SouCCCe: EMSI Gap Analysis ModelNumbers may not sum due to rounding  |

## Transfer Track (Liberal Arts) Students

A number of students attend CCC with the intention of transferring to a four-year school to receive a bachelor’s degree. Though these students study any number of topics, a large number of them receive associate of arts degrees in liberal arts. Over the past three years, an average of 168 students have completed liberal arts, pre-engineering, or humanities degrees at the associate’s degree level, which composes 13% of the college’s annual production of certificates and degrees.

Once these students leave CCC, their educational and career track is difficult to predict. They could attend a four-year college in the region or outside the region, and they could study any number of different programs that will ultimately determine their future career. What can be shown is that over the next 10 years, jobs that require a bachelor’s degree are projected to be in high demand. In any given year between 2014 and 2024, 4,968 jobs will require a bachelor’s degree and 24,090 will require a bachelor’s degree or less, availing these students of 92% of all regional job openings.

## Potential New Programs

In addition to knowing how well CCC’s current educational programs are serving the local labor market, it is helpful to know the fields of opportunity where the college could create new program offerings. Table 2.3 contains a list of 21 programmatic areas of opportunity that could fill gaps in the labor market by postsecondary vocational certificates and associate’s degrees. These selected occupations present unmet annual openings by completions within the region. Please note that these tables highlight particular occupations, and in many cases a program can be designed to train for multiple occupations. Once these occupations are grouped with other similar occupations, the actual workforce gap may be larger. Therefore, several programs with relatively small gaps are included. The median hourly earnings for workers in the Economic Region are included in the Table 2.3. The education level at which the analysis was performed is listed for each occupation.

There are 17 postsecondary certificate level areas of opportunity listed in Table 2.3. Blue collar occupations like heavy & tractor-trailer truck drivers, general maintenance & repair workers, and industrial truck & tractor operators appear to be undersupplied in the CCC Economic Region. Skilled trades like electricians and carpenters are other areas of opportunity. Wage rates are in a range between $12.27 for farmworkers, farm, ranch, & aquacultural animals to a high of $39.62 for electrical power-line installers & repairers.

The other four areas of opportunity are at the associate’s degree level. Medical & clinical laboratory technicians have the largest gap but also have low pay (only $16.93 an hour). Another healthcare related occupation, diagnostic medical sonographers, has a small gap but high wages (gap of 8; median hourly earnings $41.15). Medical equipment repairers and chemical technicians are two other potential areas of opportunity at the associate’s degree level.

Table 2.3: Programmatic Areas of Opportunity

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SOC** | **SOC Title** | **Average Annual Openings** | **Average Annual Completers** | **Gap** | **Median Hourly Earnings** | **Education Level** |
| 53-3032 | Heavy and Tractor-Trailer Truck Drivers | 318 | 113 | 205 | $17.41  | Certificate |
| 49-9071 | Maintenance and Repair Workers, General | 159 | 0 | 159 | $17.06  | Certificate |
| 53-7051 | Industrial Truck and Tractor Operators | 99 | 0 | 99 | $12.72  | Certificate |
| 51-9111 | Packaging and Filling Machine Operators and Tenders | 94 | 0 | 94 | $12.33  | Certificate |
| 45-2093 | Farmworkers, Farm, Ranch, and Aquacultural Animals | 75 | 0 | 75 | $12.27  | Certificate |
| 47-2111 | Electricians | 65 | 0 | 65 | $21.74  | Certificate |
| 49-9041 | Industrial Machinery Mechanics | 77 | 13 | 64 | $22.40  | Certificate |
| 47-2031 | Carpenters | 46 | 0 | 46 | $17.72  | Certificate |
| 51-1011 | First-Line Supervisors of Production and Operating Workers | 40 | 0 | 40 | $24.61  | Certificate |
| 43-5032 | Dispatchers, Except Police, Fire, and Ambulance | 37 | 0 | 37 | $17.93  | Certificate |
| 49-9051 | Electrical Power-Line Installers and Repairers | 32 | 0 | 32 | $39.62  | Certificate |
| 13-1199 | Business Operations Specialists, All Other | 26 | 0 | 26 | $28.52  | Certificate |
| 33-9092 | Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers | 28 | 0 | 28 | $12.43  | Certificate |
| 49-2022 | Telecommunications Equipment Installers and Repairers, Except Line Installers | 23 | 0 | 23 | $28.54  | Certificate |
| 47-2181 | Roofers | 28 | 0 | 28 | $20.97  | Certificate |
| 49-9052 | Telecommunications Line Installers and Repairers | 22 | 0 | 22 | $31.83  | Certificate |
| 25-4031 | Library Technicians | 26 | 6 | 21 | $17.29  | Certificate |
| 29-2012 | Medical and Clinical Laboratory Technicians | 13 | 3 | 10 | $16.93  | Associate |
| 29-2032 | Diagnostic Medical Sonographers | 9 | 1 | 8 | $41.15  | Associate |
| 49-9062 | Medical Equipment Repairers | 8 | 0 | 8 | $21.00  | Associate |
| 19-4031 | Chemical Technicians | 7 | 0 | 7 | $14.27  | Associate |
| SouCCCe: EMSI Gap Analysis Model |

## Conclusion

Between both postsecondary certificate level and associate’s degree level at CCC, there are a total of 12 programs associated with significant workforce gaps. Seven were at the certificate level and the remaining five were at the associate’s degree level. Some programs experienced a gap at both education levels. There were 25 programs associated with significant workforce surpluses.

General Office Occupations & Clerical Services has the largest certificate level gap (gap of 645) but compensation from related occupations is relatively low (median hourly earnings $13.89). Accounting has the second largest gap (gap of 110; median hourly wage $16.67). Child Development/Early Care & Education, the third largest certificate level gap, has a significant gap but is mapped to low paying occupations (gap of 90; median hourly earnings $9.90). The three largest associate’s degree level gaps are: General Office Occupations & Clerical Services (gap of 669; median hourly earnings $13.89), Child Development (gap of 72; median hourly earnings $9.90), and Early Care & Education (gap of 32; median hourly earnings $19.58).

Licensed Vocational Nursing (surplus 182), Dental Assistant (surplus 182), and Child Development/Early Care & Education (surplus 114) are the three programs associated with the largest surpluses of completers at the certificate level. Nursing (surplus of 511), General Social Sciences (surplus of 244), and Administration of Justice (surplus of 176) are top three associate’s degree level surpluses. For some of the programs, CCC is producing a moderate number of new completers, but additional supply from other regional institutions leads to the surplus. It is possible that some of the completers are seeking employment outside the CCC Economic Region.

There are 17 postsecondary certificate level areas of opportunity identified. The largest gaps in the programmatic areas of opportunity were for blue collar occupations that appear to be undersupplied in the CCC Economic Region like heavy & tractor-trailer truck drivers, general maintenance & repair workers, and industrial truck & tractor operators. Some skilled trades are also among the top areas of opportunity like: electricians and carpenters. Wage rates are in a range between $12.27 for farmworkers, farm, ranch, & aquacultural animals to a high of $39.62 for electrical power-line installers & repairers. An additional four areas of opportunity are at the associate’s degree level. Medical & clinical laboratory technicians have the largest gap (gap of 10), but pay only $16.93 an hour. Other healthcare related occupations, diagnostic medical sonographers and medical equipment repairers, have small gaps but high wages (gap of 8 each; median hourly earnings over $20 an hour).

# Appendix 1: About EMSI Data

As stated in Chapter 2, EMSI data were used to calculate the projected number of annual job openings from 2014 to 2024. These projections take into account openings due to job growth and openings due to replacement needs.

In order to capture a complete picture of industry employment, EMSI gathers and integrates economic, labor market, demographic, and education data from over 90 government and private-sector sources, creating a comprehensive and current database that includes both published data and detailed estimates with full coverage of the United States.

More specifically, EMSI combines covered employment data from Quarterly Census of Employment and Wages (QCEW-produced by the Department of Labor) with total employment data in Regional Economic Information System (REIS-published by the Bureau of Economic Analysis or BEA). This is augmented with County Business Patterns (CBP) and Non-Employer Statistics (NES) published by the US Census Bureau. Projections are based on the latest-available EMSI industry data, 15-year past local trends in each industry, growth rates in statewide and (where available) sub-state area industry projections published by individual state agencies, and (in part) growth rates in national projections from the Bureau of Labor Statistics.

Through this combination of data sources, EMSI is able to fill gaps in individual sources (such as suppressions and missing proprietors). This yields a composite database that leverages the strengths of all its sources. Finally, EMSI’s database is updated quarterly, providing the most up-to-date integrated information possible.

# Appendix 2: Program-to-Occupation Mapping

Table A2.1 displays the crosswalk between educational programs (CIP codes) and occupations (SOC codes) that EMSI used to complete the gap analysis. Also listed are the adjustment factors which were applied to the annual openings figures for each occupation within each program. The methodology for these factors is described in Appendix 3, with the program based weight figure recounted under “De-duplication of Annual Openings” and the educational level adjustments recounted under “Education Level Adjustments.”

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| **Table A2.1: Program to Occupation Mapping with Employment Adjustment Factors** |
|  | PECCCENT OF WORKFOCCCE WITH GIVEN EDUCATION LEVEL |
| CIP | Program | SOC | Occupation | Program Based Weight | PSV Award or Some College | Asso-ciate’s Degree |
| 3.0101 | Natural Resources/Conservation, General | 19-1031 | Conservation Scientists | 0.12 | 9 | 13 |
|   |   | 19-1032 | Foresters | 0.12 | 9 | 13 |
|   |   | 19-4093 | Forest and Conservation Technicians | 0.09 | 42 | 54 |
|   |   | 45-4011 | Forest and Conservation Workers | 0.12 | 73 | 83 |
| 3.0501 | Forestry, General | 19-1031 | Conservation Scientists | 0.88 | 9 | 13 |
|   |   | 19-1032 | Foresters | 0.88 | 9 | 13 |
|   |   | 19-4093 | Forest and Conservation Technicians | 0.63 | 42 | 54 |
|   |   | 45-4011 | Forest and Conservation Workers | 0.88 | 73 | 83 |
| 3.0511 | Forestry and Conservation Technicians | 19-4093 | Forest and Conservation Technicians | 0.28 | 42 | 54 |
| 9.0101 | Speech Communication and Rhetoric | 27-3012 | Public Address System and Other Announcers | 1.00 | 54 | 61 |
|   |   | 27-3031 | Public Relations Specialists | 0.99 | 16 | 20 |
|   |   | 27-3043 | Writers and Authors | 0.94 | 12 | 15 |
| 11.0701 | Computer Science | 11-3021 | Computer and Information Systems Managers | 0.46 | 19 | 27 |
|   |   | 15-1111 | Computer and Information Research Scientists | 0.42 | 6 | 9 |
|   |   | 15-1122 | Information Security Analysts | 0.08 | 29 | 43 |
|   |   | 15-1131 | Computer Programmers | 0.77 | 19 | 28 |
|   |   | 15-1132 | Software Developers, Applications | 0.47 | 11 | 16 |
|   |   | 15-1133 | Software Developers, Systems Software | 0.47 | 11 | 16 |
|   |   | 15-1134 | Web Developers | 0.08 | 23 | 31 |
|   |   | 15-1143 | Computer Network Architects | 0.08 | 27 | 41 |
|   |   | 15-1151 | Computer User Support Specialists | 0.09 | 40 | 57 |
|   |   | 15-1152 | Computer Network Support Specialists | 0.09 | 40 | 57 |
|   |   | 15-1199 | Computer Occupations, All Other | 0.54 | 34 | 49 |
| 11.0801 | Web Page, Digital/Multimedia and Information Resources Design | 15-1122 | Information Security Analysts | 0.17 | 29 | 43 |
|   |   | 15-1134 | Web Developers | 0.17 | 23 | 31 |
|   |   | 15-1143 | Computer Network Architects | 0.17 | 27 | 41 |
|   |   | 27-1014 | Multimedia Artists and Animators | 0.52 | 34 | 43 |
|   |   | 27-1024 | Graphic Designers | 0.55 | 31 | 44 |
| 11.1006 | Computer Support Specialist | 15-1151 | Computer User Support Specialists | 0.20 | 40 | 57 |
|   |   | 15-1152 | Computer Network Support Specialists | 0.20 | 40 | 57 |
| 13.121 | Early Childhood Education and Teaching | 25-2011 | Preschool Teachers, Except Special Education | 0.35 | 39 | 53 |
|   |   | 25-2012 | Kindergarten Teachers, Except Special Education | 0.55 | 39 | 53 |
| 13.1314 | Physical Education Teaching and Coaching | 25-2022 | Middle School Teachers, Except Special and Career/Technical Education | 0.14 | 3 | 5 |
|   |   | 25-2031 | Secondary School Teachers, Except Special and Career/Technical Education | 0.12 | 3 | 4 |
|   |   | 27-2022 | Coaches and Scouts | 0.11 | 32 | 40 |
|   |   | 27-2023 | Umpires, Referees, and Other Sports Officials | 0.39 | 32 | 40 |
|   |   | 39-9031 | Fitness Trainers and Aerobics Instructors | 0.11 | 45 | 55 |
| 15.0506 | Water Quality and Wastewater Treatment Management and Recycling Technology/Technician | 51-8031 | Water and Wastewater Treatment Plant and System Operators | 1.00 | 79 | 91 |
| 15.0613 | Manufacturing Engineering Technology/Technician | 17-2112 | Industrial Engineers | 1.00 | 19 | 28 |
|   |   | 17-3026 | Industrial Engineering Technicians | 0.52 | 60 | 83 |
|   |   | 27-1021 | Commercial and Industrial Designers | 0.74 | 31 | 44 |
| 16.9999 | Foreign Languages, Literatures, and Linguistics, Other | 27-3091 | Interpreters and Translators | 0.00 | 37 | 50 |
| 19.0706 | Child Development | 21-1093 | Social and Human Service Assistants | 0.47 | 50 | 60 |
|   |   | 25-2011 | Preschool Teachers, Except Special Education | 0.36 | 39 | 53 |
|   |   | 39-9011 | Childcare Workers | 0.25 | 75 | 84 |
| 19.0709 | Child Care Provider/Assistant | 39-9011 | Childcare Workers | 0.75 | 75 | 84 |
| 23.9999 | English Language and Literature/Letters, Other | 25-1099 | Postsecondary Teachers | 0.00 | 3 | 5 |
| 26.0101 | Biology/Biological Sciences, General | 11-9121 | Natural Sciences Managers | 0.45 | 7 | 11 |
|   |   | 19-1029 | Biological Scientists, All Other | 0.81 | 1 | 4 |
|   |   | 19-1099 | Life Scientists, All Other | 0.79 | 1 | 2 |
| 27.0101 | Mathematics, General | 11-9121 | Natural Sciences Managers | 0.17 | 7 | 11 |
|   |   | 15-2021 | Mathematicians | 0.91 | 8 | 11 |
|   |   | 15-2041 | Statisticians | 0.98 | 8 | 11 |
|   |   | 15-2099 | Mathematical Science Occupations, All Other | 0.97 | 8 | 11 |
| 40.0101 | Physical Sciences | 11-9121 | Natural Sciences Managers | 0.02 | 7 | 11 |
| 40.0801 | Physics, General | 11-9121 | Natural Sciences Managers | 0.02 | 7 | 11 |
|   |   | 19-2012 | Physicists | 1.00 | 6 | 7 |
| 42.0101 | Psychology, General | 19-3031 | Clinical, Counseling, and School Psychologists | 0.96 | 1 | 1 |
|   |   | 19-3032 | Industrial-Organizational Psychologists | 1.00 | 1 | 1 |
|   |   | 19-3039 | Psychologists, All Other | 0.86 | 1 | 1 |
| 43.0103 | Criminal Justice/Law EnfoCCCement Administration | 33-1012 | First-Line Supervisors of Police and Detectives | 0.55 | 44 | 59 |
| 43.0104 | Criminal Justice/Safety Studies | 33-1012 | First-Line Supervisors of Police and Detectives | 0.37 | 44 | 59 |
| 43.0107 | Criminal Justice/Police Science | 33-3011 | Bailiffs | 1.00 | 73 | 86 |
|   |   | 33-3021 | Detectives and Criminal Investigators | 1.00 | 33 | 46 |
|   |   | 33-3051 | Police and Sheriff's Patrol Officers | 1.00 | 49 | 66 |
|   |   | 33-9021 | Private Detectives and Investigators | 1.00 | 38 | 50 |
|   |   | 33-9031 | Gaming Surveillance Officers and Gaming Investigators | 0.97 | 74 | 84 |
| 45.0101 | Social Sciences, General | 19-3099 | Social Scientists and Related Workers, All Other | 0.80 | 6 | 10 |
|   |   | 19-4061 | Social Science Research Assistants | 1.00 | 42 | 54 |
| 47.0608 | Aircraft Powerplant Technology/Technician | 49-3011 | Aircraft Mechanics and Service Technicians | 0.29 | 69 | 90 |
|   |   | 51-2011 | Aircraft Structure, Surfaces, Rigging, and Systems Assemblers | 0.34 | 85 | 93 |
| 48.0501 | Machine Tool Technology/Machinist | 51-4021 | Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 90 | 96 |
|   |   | 51-4022 | Forging Machine Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 89 | 96 |
|   |   | 51-4023 | Rolling Machine Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 95 | 98 |
|   |   | 51-4031 | Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 94 | 98 |
|   |   | 51-4032 | Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 88 | 98 |
|   |   | 51-4033 | Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 92 | 97 |
|   |   | 51-4034 | Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 89 | 95 |
|   |   | 51-4035 | Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 91 | 96 |
|   |   | 51-4041 | Machinists | 1.00 | 86 | 97 |
|   |   | 51-4081 | Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 91 | 96 |
|   |   | 51-4191 | Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 90 | 94 |
|   |   | 51-4192 | Layout Workers, Metal and Plastic | 1.00 | 91 | 96 |
|   |   | 51-4193 | Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic | 1.00 | 87 | 94 |
|   |   | 51-4199 | Metal Workers and Plastic Workers, All Other | 1.00 | 91 | 96 |
| 48.0508 | Welding Technology/Welder | 51-4121 | Welders, Cutters, Solderers, and Brazers | 1.00 | 92 | 98 |
|   |   | 51-4122 | Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders | 1.00 | 92 | 98 |
| 50.0409 | Graphic Design | 27-1011 | Art Directors | 1.00 | 34 | 43 |
|   |   | 27-1014 | Multimedia Artists and Animators | 0.30 | 34 | 43 |
|   |   | 27-1019 | Artists and Related Workers, All Other | 0.96 | 34 | 43 |
|   |   | 27-1024 | Graphic Designers | 0.32 | 31 | 44 |
|   |   | 51-9123 | Painting, Coating, and Decorating Workers | 1.00 | 93 | 97 |
| 50.0708 | Painting | 27-1012 | Craft Artists | 0.10 | 34 | 43 |
|   |   | 27-1013 | Fine Artists, Including Painters, Sculptors, and Illustrators | 0.10 | 34 | 43 |
|   |   | 27-1014 | Multimedia Artists and Animators | 0.13 | 34 | 43 |
| 50.0709 | Sculpture | 27-1012 | Craft Artists | 0.02 | 34 | 43 |
|   |   | 27-1013 | Fine Artists, Including Painters, Sculptors, and Illustrators | 0.02 | 34 | 43 |
| 51.0716 | Medical Administrative/Executive Assistant and Medical Secretary | 31-9092 | Medical Assistants | 0.05 | 69 | 91 |
|   |   | 43-6011 | Executive Secretaries and Executive Administrative Assistants | 0.47 | 67 | 81 |
|   |   | 43-6013 | Medical Secretaries | 0.25 | 67 | 81 |
| 51.2601 | Health Aide | 31-1013 | Psychiatric Aides | 0.11 | 83 | 91 |
|   |   | 31-1014 | Nursing Assistants | 0.13 | 83 | 91 |
| 51.3801 | Registered Nursing/Registered Nurse | 29-1141 | Registered Nurses | 0.61 | 6 | 45 |
| 51.3901 | Licensed Practical/Vocational Nurse Training | 29-2061 | Licensed Practical and Licensed Vocational Nurses | 0.34 | 78 | 95 |
| 52.0101 | Business/Commence, General | 11-1011 | Chief Executives | 0.02 | 27 | 33 |
|   |   | 11-1021 | General and Operations Managers | 0.02 | 42 | 51 |
|   |   | 11-2022 | Sales Managers | 0.02 | 27 | 33 |
|   |   | 11-3011 | Administrative Services Managers | 0.02 | 48 | 59 |
|   |   | 11-3051 | Industrial Production Managers | 0.02 | 47 | 56 |
|   |   | 11-3071 | Transportation, Storage, and Distribution Managers | 0.02 | 63 | 71 |
|   |   | 11-9021 | Construction Managers | 0.01 | 59 | 66 |
|   |   | 11-9151 | Social and Community Service Managers | 0.01 | 25 | 31 |
|   |   | 11-9199 | Managers, All Other | 0.01 | 38 | 46 |
|   |   | 13-1051 | Cost Estimators | 0.01 | 55 | 67 |
|   |   | 13-1111 | Management Analysts | 0.02 | 18 | 23 |
| 52.0201 | Business Administration and Management, General | 11-1011 | Chief Executives | 0.96 | 27 | 33 |
|   |   | 11-1021 | General and Operations Managers | 0.95 | 42 | 51 |
|   |   | 11-2022 | Sales Managers | 0.98 | 27 | 33 |
|   |   | 11-3011 | Administrative Services Managers | 0.96 | 48 | 59 |
|   |   | 11-3051 | Industrial Production Managers | 0.98 | 47 | 56 |
|   |   | 11-3071 | Transportation, Storage, and Distribution Managers | 0.96 | 63 | 71 |
|   |   | 11-9021 | Construction Managers | 0.92 | 59 | 66 |
|   |   | 11-9151 | Social and Community Service Managers | 0.86 | 25 | 31 |
|   |   | 11-9199 | Managers, All Other | 0.89 | 38 | 46 |
|   |   | 13-1051 | Cost Estimators | 0.92 | 55 | 67 |
|   |   | 13-1111 | Management Analysts | 0.96 | 18 | 23 |
|   |   | 37-1011 | First-Line Supervisors of Housekeeping and Janitorial Workers | 0.95 | 83 | 89 |
|   |   | 39-1011 | Gaming Supervisors | 0.95 | 58 | 68 |
|   |   | 39-1021 | First-Line Supervisors of Personal Service Workers | 0.95 | 64 | 74 |
| 52.0301 | Accounting | 13-2011 | Accountants and Auditors | 0.34 | 12 | 22 |
|   |   | 13-2031 | Budget Analysts | 0.95 | 23 | 32 |
|   |   | 13-2041 | Credit Analysts | 0.95 | 29 | 37 |
|   |   | 13-2061 | Financial Examiners | 1.00 | 17 | 20 |
|   |   | 13-2081 | Tax Examiners and Collectors, and Revenue Agents | 1.00 | 42 | 52 |
| 52.0302 | Accounting Technology/Technician and Bookkeeping | 13-2082 | Tax Preparers | 1.00 | 41 | 50 |
|   |   | 43-3021 | Billing and Posting Clerks | 1.00 | 70 | 83 |
|   |   | 43-3031 | Bookkeeping, Accounting, and Auditing Clerks | 0.91 | 72 | 83 |
|   |   | 43-3041 | Gaming Cage Workers | 1.00 | 82 | 89 |
|   |   | 43-3051 | Payroll and Timekeeping Clerks | 1.00 | 68 | 81 |
|   |   | 43-4011 | Brokerage Clerks | 1.00 | 50 | 59 |
|   |   | 43-9111 | Statistical Assistants | 1.00 | 56 | 67 |
| 52.0401 | Administrative Assistant and Secretarial Science, General | 43-6011 | Executive Secretaries and Executive Administrative Assistants | 0.53 | 67 | 81 |
|   |   | 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 1.00 | 67 | 81 |
| 52.0408 | General Office Occupations and Clerical Services | 43-3061 | Procurement Clerks | 1.00 | 60 | 71 |
|   |   | 43-4021 | Correspondence Clerks | 1.00 | 73 | 83 |
|   |   | 43-4031 | Court, Municipal, and License Clerks | 1.00 | 65 | 81 |
|   |   | 43-4071 | File Clerks | 1.00 | 66 | 78 |
|   |   | 43-4151 | Order Clerks | 1.00 | 73 | 83 |
|   |   | 43-4161 | Human Resources Assistants, Except Payroll and Timekeeping | 1.00 | 57 | 71 |
|   |   | 43-4171 | Receptionists and Information Clerks | 1.00 | 74 | 85 |
|   |   | 43-4199 | Information and Record Clerks, All Other | 1.00 | 60 | 77 |
|   |   | 43-5011 | Cargo and Freight Agents | 1.00 | 71 | 83 |
|   |   | 43-5051 | Postal Service Clerks | 1.00 | 74 | 83 |
|   |   | 43-5052 | Postal Service Mail Carriers | 1.00 | 76 | 86 |
|   |   | 43-5053 | Postal Service Mail Sorters, Processors, and Processing Machine Operators | 1.00 | 76 | 85 |
|   |   | 43-5071 | Shipping, Receiving, and Traffic Clerks | 1.00 | 86 | 92 |
|   |   | 43-5111 | Weighers, Measurers, Checkers, and Samplers, Recordkeeping | 1.00 | 81 | 88 |
|   |   | 43-9022 | Word Processors and Typists | 1.00 | 68 | 81 |
|   |   | 43-9041 | Insurance Claims and Policy Processing Clerks | 1.00 | 65 | 77 |
|   |   | 43-9051 | Mail Clerks and Mail Machine Operators, Except Postal Service | 1.00 | 80 | 89 |
|   |   | 43-9061 | Office Clerks, General | 1.00 | 68 | 80 |
|   |   | 43-9071 | Office Machine Operators, Except Computer | 1.00 | 76 | 86 |
|   |   | 43-9199 | Office and Administrative Support Workers, All Other | 0.99 | 57 | 68 |
| 52.0703 | Small Business Administration/ Management | 11-9199 | Managers, All Other | 0.01 | 38 | 46 |

Completion data gathered for this analysis listed programs and program codes by CIP. In order to identify programs by the Taxonomy of Programs (TOP) as used by the California Community College a CIP to TOP crosswalk was used. Table A2.2 displays the entire CIP to TOP crosswalk as used in this analysis. Note: Due to the fact that TOP codes are not as detailed as CIP codes, there are several different programs that have the same TOP codes and titles. In order to differentiate the programs with the same TOP codes and titles, refer to the CIP titles for further description of the programs.

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| **Table A2.2: CIP to TOP Program Mapping** |
| CIP | CIP Title | TOP | TOP Title |
| 1 | Agriculture, General | 101.00 | Agriculture Technology and Sciences, General |
| 1.0101 | Agricultural Business and Management, General | 101.00 | Agriculture Technology and Sciences, General |
| 1.0102 | Agribusiness/Agricultural Business Operations | 112.00 | Agriculture Business, Sales and Service |
| 1.0205 | Agricultural Mechanics and Equipment/Machine Technology | 116.00 | Agricultural Power Equipment Technology |
| 1.0299 | Agricultural Mechanization, Other. | 116.00 | Agricultural Power Equipment Technology |
| 1.0302 | Animal/Livestock Husbandry and Production | 102.00 | Animal Science |
| 1.0304 | Crop Production | 103.00 | Plant Science |
| 1.0899 | Agricultural Public Services, Other. | 116.00 | Agricultural Power Equipment Technology |
| 1.1299 | Soil Sciences, Other | 103.00 | Plant Science |
| 3.0101 | Natural Resources/Conservation, General | 115.00 | Natural Resources |
| 3.0501 | Forestry, General | 114.00 | Forestry |
| 3.0511 | Forestry and Conservation Technicians | 114.00 | Forestry |
| 3.0599 | Forestry, Other | 114.00 | Forestry |
| 3.9999 | Forest Surveying Technology | 399.00 | Environmental Sciences and Technologies, Other |
| 9.0101 | Speech Communication and Rhetoric | 1506.00 | Speech Communication |
| 10.0304 | Animation, Interactive Technology, Video Graphics and Special Effects | 614.10 | Multimedia |
| 11.0101 | Computer and Information Sciences, General | 701.00 | Information Technology, General |
| 11.0103 | Information Technology | 702.00 | Computer Information Systems |
| 11.0701 | Computer Science | 706.00 | Computer Science (transfer) |
| 11.0801 | Web Page, Digital/Multimedia and Information Resources Design | 614.30 | Website Design and Development |
| 11.0803 | Computer Graphics | 614.60 | Computer Graphics and Digital Imagery |
| 11.0901 | Computer Systems Networking and Telecommunications | 708.10 | Computer Networking |
| 11.1003 | Computer and Information Systems Security/Information Assurance | 708.00 | Computer Infrastructure and Support |
| 11.1004 | Web/Multimedia Management and Webmaster | 709.00 | World Wide Web Administration |
| 11.1006 | Computer Support Specialist | 708.20 | Computer Support |
| 13.1015 | Education/Teaching of Individuals in Early Childhood Special Education Programs | 1305.20 | Children with Special Needs |
| 13.121 | Early Childhood Education and Teaching | 1305.00 | Child Development/Early Care and Education |
| 13.1314 | Physical Education Teaching and Coaching | 835.00 | Physical Education |
| 15.0506 | Water Quality and Wastewater Treatment Management and Recycling Technology/Technician | 958.00 | Water and Wastewater Technology |
| 15.0613 | Manufacturing Engineering Technology/Technician | 956.00 | Manufacturing and Industrial Technology |
| 16.9999 | Foreign Languages, Literatures, and Linguistics, Other | 1199.00 | Other Foreign Languages |
| 19.0706 | Child Development | 1305.00 | Child Development/Early Care and Education |
| 19.0709 | Child Care Provider/Assistant | 1305.00 | Child Development/Early Care and Education |
| 23.9999 | English Language and Literature/Letters, Other | 1502.00 | Language Arts |
| 26.0101 | Biology/Biological Sciences, General | 401.00 | Biology, General |
| 27.0101 | Mathematics, General | 1701.00 | Mathematics, General |
| 31.0301 | Parks, Recreation and Leisure Facilities Management, General | 115.10 | Parks and Outdoor Recreation |
| 40.0101 | Physical Sciences | 1901.00 | Physical Sciences, General |
| 42.0101 | Psychology, General | 2001.00 | Psychology, General |
| 43.0103 | Criminal Justice/Law Enforcement Administration | 2105.00 | Administration of Justice |
| 43.0104 | Criminal Justice/Safety Studies | 2105.00 | Administration of Justice |
| 43.0107 | Criminal Justice/Police Science | 2105.00 | Administration of Justice |
| 45.0101 | Social Sciences, General | 2201.00 | Social Sciences, General |
| 47.0604 | Automobile/Automotive Mechanics Technology/Technician | 948.00 | Automotive Technology |
| 47.0607 | Airframe Mechanics and Aircraft Maintenance Technology/Technician | 950.00 | Aeronautical and Aviation Technology |
| 47.0608 | Aircraft Powerplant Technology/Technician | 950.20 | Aviation Powerplant Mechanics |
| 47.0699 | Vehicle Maintenance and Repair Technologies, Other | 948.00 | Automotive Technology |
| 48.0501 | Machine Tool Technology/Machinist | 956.30 | Machining and Machine Tools |
| 48.0508 | Welding Technology/Welder | 956.50 | Welding Technology |
| 49.0104 | Aviation/Airway Management and Operations | 3020.00 | Aviation and Airport Management and Services |
| 50.0409 | Graphic Design | 1030.00 | Graphic Art and Design |
| 50.0708 | Painting | 1002.00 | Art (Painting, Drawing, and Sculpture) |
| 50.0709 | Sculpture | 1002.20 | Sculpture |
| 50.0911 | Stringed Instruments. | 1004.00 | Music |
| 51.0601 | Dental Assisting/Assistant | 1240.10 | Dental Assistant |
| 51.0602 | Dental Hygiene/Hygienist | 1240.20 | Dental Hygienist |
| 51.0716 | Medical Administrative/Executive Assistant and Medical Secretary | 514.20 | Medical Office Technology |
| 51.2601 | Health Aide | 1201.00 | Health Occupations, General |
| 51.3801 | Registered Nursing/Registered Nurse | 1230.00 | Nursing |
| 51.3901 | Licensed Practical/Vocational Nurse Training | 1230.20 | Licensed Vocational Nursing |
| 52.0101 | Business/Commence, General | 501.00 | Business and Commence, General |
| 52.0201 | Business Administration and Management, General | 505.00 | Business Administration |
| 52.0299 | Business Administration, Management and Operations, Other | 505.00 | Business Administration |
| 52.0301 | Accounting | 502.00 | Accounting |
| 52.0302 | Accounting Technology/Technician and Bookkeeping | 502.00 | Accounting |
| 52.0401 | Administrative Assistant and Secretarial Science, General | 514.00 | Office Technology/Office Computer Applications |
| 52.0408 | General Office Occupations and Clerical Services | ??? | General Office Occupations and Clerical Services |
| 52.0703 | Small Business Administration/Management | 506.40 | Small Business and Entrepreneurship |

# Appendix 3: Program Gap Analysis Methodology

This appendix focuses on describing and understanding the methodology used in the program gap analysis. This requires data on both occupation demand (e.g., annual job openings) and education supply (e.g., number of postsecondary degree completions). These are then compared through an education “gap” analysis to determine whether an education program is potentially producing a surplus or shortage of workforce talent relative to the number of job openings. In this way, it is possible to see how the institution’s current programs are satisfying regional workforce needs.

## Supply and Demand Model

EMSI builds a model using demand-side data (average annual openings) and supply-side data (postsecondary education output) to compare workforce demand with education supply. The purpose of this analysis is to find the difference or “gap” between the average annual openings for an occupation and the number of people completing postsecondary degrees for that occupation, whether at CCC or at another training provider within one of the regions. This makes it possible to identify whether there may be talent shortages or surpluses within the Economic Region.

The first step involves mapping the linkage between annual openings for a SOC code and the number of completions for an education program CIP code. The BLS provides information on the occupations that completers of specific CIP codes are more likely to enter. Specific connections have been refined through previous engagements with education institutions and state departments of labor. Some programs have direct occupational ties. For example, a physical therapist assistant is a specific occupation that requires specialized postsecondary training. In this case, one CIP code (physical therapy technician/assistant) maps to only one SOC code (physical therapists assistants). This provides an easy comparison of annual openings for physical therapist assistants to the number of people completing the relevant program to see whether a talent shortage or surplus exists. Unfortunately, this is not always the case. More often than not an educational program maps to multiple occupations and an occupation maps to multiple educational programs. For this reason, EMSI has pioneered a method of de-duplicating completers, such that the potential sources of supply are not double-counted for any occupation. The details of this process are outlined in this chapter, under “De-duplication of Annual Openings.”

## Occupation Demand

### Educational Level Adjustments

To capture occupation demand, EMSI uses a proprietary employment dataset that reflects total employment (i.e., employment covered by unemployment insurance as well as proprietor employment). The employment data reflects jobs for the third quarter of 2014. Within this dataset, EMSI calculates the number of regional annual job openings for the occupations that require two different levels of postsecondary training.[[8]](#footnote-8) The BLS also provides educational attainment data of current workers for each SOC code, broken out by their highest level of education attained. The data is presented as the percentage of workers in the SOC code with educational attainment ranging from less than a high school degree to an associate’s degree. Using these data, EMSI adjusted the annual opening estimates for each SOC code to only incorporate the percentage of workers for three different educational levels that correspond with CCC’s program offerings.

For example, as shown in Table A3.1, there are three occupations trained for by Corrections (CIP code 43.0102). Within that cluster are an assortment of career fields, including correctional officers and jailers, first-line supervisors of police and detectives, and first-line supervisors of correctional officers. Among correctional officers, the majority of job openings (75%) are available to somebody with “some college” or a postsecondary vocational award. Alternatively, for first-line supervisors of police and detectives, only 46% of job openings are accessible to a person without a college degree. The weighted average of job openings is calculated for each program at each program/degree level where CCC has produced completers over the past three years. Not taking into account the educational attainment dynamics in this way would bias the result by over-counting potential job opportunities for completers.[[9]](#footnote-9)

Table A3.1: Educational Level Adjustments

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CIP Code** | **CIP Title** | **SOC** | **Title** | **“Some College, No Degree” or Postsecondary Award or Lower** | **Associate’s Degree or Lower** |
| 43.0102 | Corrections | 33-3012 |  Correctional Officers and Jailers | 75% | 88% |
|  |  | 33-1012 |  First-Line Supervisors of Police and Detectives | 46% | 62% |
|  |  | 33-1011 |  First-Line Supervisors of Correctional Officers | 61% | 75% |
|  | Weighted Average |  |  | 68% | 85% |

### De-duplication of Annual Openings

Most educational programs are designed to train people for multiple occupational types, many of which are simultaneously linked with other educational programs, presenting a complexity when comparing supply and demand for any particular educational program. For instance, the Computer Systems Networking & Telecommunications program is mapped to three different occupations: computer support specialists, information security analysts, and computer systems analysts. If we focus on just one of the occupations for this list—computer support specialists—it is also mapped to 10 different educational programs, spanning program titles such as Computer Systems Analysis and Medical Office Computer Specialist.

To ensure that no double-counting occurs, it is necessary to either realign the program groupings to eliminate the mapping of occupations to multiple programs, or to determine what proportion of demand should be compared with supply numbers from each program. EMSI takes the second approach in this analysis, which has the advantage of maintaining the program titles and descriptions in roughly the same format that completer data were originally delivered to EMSI. EMSI uses a formula that favors program types with the largest number of completers, attributing a greater proportion of demand to these than the programs which produce a smaller number of completers. This method utilizes the assumption that the higher output educational programs are likely feeding a higher degree of demand within the Economic Region.[[10]](#footnote-10) Appendix 2 contains the detailed mapping of each CIP code to all relevant occupations.

One possible criticism of this methodology is that it assumes, all else being equal, students from higher-output programs are more likely to obtain a job than students from lower-output programs, whereas in reality students are judged more by their skills and merits than their educational program of study. The intention of the analysis is not to rate students’ capability of competing for jobs, but rather to capture the unique dynamics of the local labor market. For example, in a region where a unique program such as Commercial and Advertising Art is more prevalent than Graphic Design, it can safely be assumed that the graduates of the Commercial and Advertising Art program will be offered a larger number of local openings than are students from the Graphic Design program. If such were not the case, it would be unlikely for the Commercial and Advertising Art program to remain the producer of local talent in the long-term, as the program would yield students to a program with a more successful job placement rate.

Recognizing that some smaller programs produce students who are more capable of obtaining local jobs than students from larger programs, EMSI also provides an alternative gap analysis, which does not reduce the number of annual openings based on the size of each educational program. Rather the total number of annual openings available for students at each educational level is provided without further modification. Due to this modification, these numbers have not been de-duplicated, unlike the annual openings figures shown in Chapter 2. These figures are provided in Appendix 4: Alternative Supply and Demand Calculations.

## Education Output

There are several educational institutions in the Economic Region, some of which have programs similar to those offered at CCC. Hence completers at CCC will be competing for some jobs with completers from other regional institutions. EMSI determined education output by Classification of Instructional Program (CIP) codes and identified the number of completers for every award level within those CIP codes. To find the output for all public and private education institutions in the Economic Region, EMSI used data from the Integrated Postsecondary Educational System (IPEDS).[[11]](#footnote-11) These data are publicly available through the National Center for Educational Statistics. Completions data were averaged for a three-year period, 2011 through 2013, to smooth out any bumps in enrollment that may be unique to a particular academic year. Data gathered directly from CCC was used to replace IPEDS data for CCC and includes 2014 completions.

Tables A3.2 and A3.3 display the completion breakdown by institution and award type. CCC is one of many institutions this region, granting 853 certificates and 504 associate’s degrees, which is 10% of both totals.

Table A3.2: Summary of Postsecondary Certificate Level Regional Completions by Institution

|  |  |  |
| --- | --- | --- |
| **Institution** | **3-Year Average** | **Percent of Total** |
| Advanced Career Institute |  245  | 3% |
| Clovis Adult Education |  151  | 2% |
| Clovis Community College |  46  | 1% |
| College of the Sequoias |  461  | 6% |
| Estes Institute of Cosmetology Arts and Science |  78  | 1% |
| Fresno City College |  1,331  | 17% |
| Galen College of Medical and Dental Assistants |  57  | 1% |
| Heald College-Fresno |  19  | 0% |
| Institute of Technology Inc |  1,901  | 24% |
| Kaplan College-Fresno |  316  | 4% |
| Lyles Fresno College of Beauty |  37  | 0% |
| Madera Beauty College |  38  | 0% |
| Manchester Beauty College |  42  | 1% |
| Milan Institute of Cosmetology-Visalia |  135  | 2% |
| Milan Institute-Clovis |  256  | 3% |
| Milan Institute-Visalia |  271  | 3% |
| Paul Mitchell the School-Fresno |  84  | 1% |
| Porterville College |  109  | 1% |
| Proteus |  31  | 0% |
| **Clovis College** |  **853**  | **11%** |
| San Joaquin Valley College-Fresno |  88  | 1% |
| San Joaquin Valley College-Online |  116  | 1% |
| San Joaquin Valley College-Visalia |  343  | 4% |
| Sierra Valley College of Court Reporting |  8  | 0% |
| Tulare Beauty College |  23  | 0% |
| UEI College-Fresno |  564  | 7% |
| University of Phoenix-Central Valley Campus |  0  | 0% |
| West Hills College-Coalinga |  167  | 2% |
| West Hills College-Lemoore |  39  | 0% |
| **Grand Total** |  **7,807**  | **100%** |
| SouCCCe: IPEDS; CCC |

Table A3.3: Summary of Associate’s Degree Regional Completions by Institution

|  |  |  |
| --- | --- | --- |
| **Institution** | **3-Year Average** | **PeCCCent of Total** |
| California Christian College |  1  | 0% |
| Clovis Community College |  178  | 3% |
| College of the Sequoias |  962  | 16% |
| Fresno City College |  1,172  | 19% |
| Heald College-Fresno |  530  | 9% |
| Institute of Technology Inc |  401  | 7% |
| ITT Technical Institute-Clovis |  153  | 3% |
| Kaplan College-Fresno |  60  | 1% |
| Porterville College |  263  | 4% |
| **Clovis College** |  **504**  | **8%** |
| San Joaquin Valley College-Fresno |  429  | 7% |
| San Joaquin Valley College-Fresno Aviation |  45  | 1% |
| San Joaquin Valley College-Online |  31  | 1% |
| San Joaquin Valley College-Visalia |  748  | 12% |
| West Hills College-Coalinga |  217  | 4% |
| West Hills College-Lemoore |  322  | 5% |
| **Grand Total** |  **6,017**  | **100%** |
| SouCCCe: IPEDS; CCC |

# Appendix 4: Alternative Gap Analysis Calculations

EMSI de-duplicated the annual openings shown in Chapter 2 to account for the magnitude of output from different educational programs in the region. The process is explained in detail in Appendix 3 under “De-duplication of Annual Openings.” This procedure is designed to reflect the unique supply and demand dynamics of each regional economy. However, EMSI also recognizes that in some cases a student from a less predominant educational program is a more likely candidate to be offered a local job. These alternative supply and demand calculations give equal weight to every job opportunity within students’ field of study, regardless of whether that program is a big or small player in talent development for the region. Therefore, these estimates should be considered as less conservative measures than those from Chapter 2.

### Alternative Gap Analysis Tables

|  |
| --- |
| **Table A4.1: Alternative Supply and Demand for CCC’s Postsecondary Certificate Programs** |
| TOP | Program | Average Annual Openings | Average Annual Completers | CCC Completers | Total Gap or Surplus |
| ??? | General Office Occupations and Clerical Services | 726 | 80 | 11 | 646  |
| 1305.00 | Child Development/Early Care and Education | 313 | 4 | 4 | 309  |
| 501.00 | Business and Commence, General | 241 | 6 | 3 | 236  |
| 502.00 | Accounting | 206 | 86 | 17 | 120  |
| 514.20 | Medical Office Technology | 224 | 106 | 32 | 118  |
| 1201.00 | Health Occupations, General | 193 | 81 | 80 | 112  |
| 505.00 | Business Administration | 287 | 191 | 5 | 95  |
| 101.00 | Agriculture Technology and Sciences, General | 95 | 6 | 6 | 89  |
| 103.00 | Plant Science | 108 | 29 | 26 | 79  |
| 514.00 | Office Technology/Office Computer Applications | 196 | 125 | 35 | 70  |
| 505.00 | Business Administration | 66 | 4 | 4 | 62  |
| 116.00 | Agricultural Power Equipment Technology | 70 | 13 | 13 | 57  |
| 112.00 | Agriculture Business, Sales and Service | 95 | 40 | 39 | 56  |
| 502.00 | Accounting | 49 | 9 | 7 | 40  |
| 835.00 | Physical Education | 26 | 3 | 3 | 23  |
| 708.10 | Computer Networking | 35 | 14 | 1 | 21  |
| 115.10 | Parks and Outdoor Recreation | 20 | 4 | 4 | 17  |
| 950.00 | Aeronautical and Aviation Technology | 32 | 16 | 14 | 16  |
| 958.00 | Water and Wastewater Technology | 19 | 3 | 0 | 16  |
| 948.00 | Automotive Technology | 90 | 77 | 29 | 13  |
| 702.00 | Computer Information Systems | 14 | 4 | 2 | 11  |
| 506.40 | Small Business and Entrepreneurship | 20 | 10 | 0 | 11  |
| 115.00 | Natural Resources | 13 | 4 | 4 | 9  |
| 614.60 | Computer Graphics and Digital Imagery | 9 | 0 | 0 | 8  |
| 114.00 | Forestry | 6 | 2 | 2 | 5  |
| 701.00 | Information Technology, General | 26 | 22 | 10 | 4  |
| 114.00 | Forestry | 6 | 4 | 4 | 3  |
| 1230.00 | Nursing | 30 | 30 | 6 | 0  |
| 709.00 | World Wide Web Administration | 5 | 6 | 1 | (1) |
| 950.20 | Aviation Powerplant Mechanics | 29 | 31 | 31 | (2) |
| 116.00 | Agricultural Power Equipment Technology | 18 | 21 | 21 | (3) |
| 1030.00 | Graphic Art and Design | 10 | 13 | 7 | (3) |
| 614.10 | Multimedia | 2 | 6 | 1 | (4) |
| 399.00 | Environmental Sciences and Technologies, Other | 3 | 9 | 9 | (6) |
| 956.50 | Welding Technology | 35 | 43 | 19 | (8) |
| 1305.20 | Children with Special Needs | 3 | 11 | 0 | (8) |
| 708.20 | Computer Support | 24 | 37 | 18 | (13) |
| 956.30 | Machining and Machine Tools | 44 | 58 | 36 | (14) |
| 114.00 | Forestry | 13 | 32 | 30 | (18) |
| 956.00 | Manufacturing and Industrial Technology | 4 | 34 | 11 | (30) |
| 614.30 | Website Design and Development | 13 | 58 | 0 | (45) |
| 1305.00 | Child Development/Early Care and Education | 220 | 279 | 65 | (59) |
| 2105.00 | Administration of Justice | 70 | 131 | 14 | (61) |
| 116.00 | Agricultural Power Equipment Technology | 57 | 140 | 140 | (83) |
| 1230.20 | Licensed Vocational Nursing | 110 | 220 | 64 | (109) |
| 1240.10 | Dental Assistant | 39 | 196 | 24 | (158) |

|  |
| --- |
| **Table A4.2: Alternative Supply and Demand for CCC’s Associate’s Degree Programs** |
| TOP | Program | Average Annual Openings | Average Annual Completers | CCC Completers | Total Gap or Surplus |
| ??? | General Office Occupations and Clerical Services | 762 | 92 | 5 | 670  |
| 1305.00 | Child Development/Early Care and Education | 362 | 35 | 30 | 327  |
| 514.20 | Medical Office Technology | 178 | 25 | 9 | 153  |
| 102.00 | Animal Science | 124 | 3 | 1 | 121  |
| 101.00 | Agriculture Technology and Sciences, General | 100 | 1 | 1 | 99  |
| 948.00 | Automotive Technology | 100 | 3 | 3 | 97  |
| 103.00 | Plant Science | 92 | 2 | 0 | 90  |
| 1305.00 | Child Development/Early Care and Education | 83 | 3 | 1 | 80  |
| 706.00 | Computer Science (transfer) | 59 | 3 | 2 | 56  |
| 112.00 | Agriculture Business, Sales and Service | 67 | 13 | 10 | 54  |
| 502.00 | Accounting | 62 | 12 | 9 | 50  |
| 708.00 | Computer Infrastructure and Support | 38 | 1 | 1 | 37  |
| 835.00 | Physical Education | 32 | 7 | 7 | 25  |
| 506.40 | Small Business and Entrepreneurship | 15 | 2 | 2 | 13  |
| 1199.00 | Other Foreign Languages | 8 | 1 | 0 | 8  |
| 1004.00 | Music | 8 | 0 | 0 | 8  |
| 3020.00 | Aviation and Airport Management and Services | 12 | 6 | 6 | 6  |
| 1502.00 | Language Arts | 9 | 4 | 3 | 5  |
| 956.30 | Machining and Machine Tools | 4 | 1 | 1 | 3  |
| 103.00 | Plant Science | 1 | 1 | 1 | 0  |
| 956.00 | Manufacturing and Industrial Technology | 2 | 2 | 1 | (0) |
| 1002.20 | Sculpture | 1 | 3 | 1 | (2) |
| 1901.00 | Physical Sciences, General | 0 | 3 | 1 | (3) |
| 956.50 | Welding Technology | 2 | 6 | 1 | (4) |
| 114.00 | Forestry | 4 | 11 | 10 | (6) |
| 101.00 | Agriculture Technology and Sciences, General | 1 | 11 | 4 | (10) |
| 1002.00 | Art (Painting, Drawing, and Sculpture) | 3 | 14 | 8 | (11) |
| 1230.20 | Licensed Vocational Nursing | 25 | 43 | 3 | (18) |
| 505.00 | Business Administration | 150 | 173 | 23 | (24) |
| 1506.00 | Speech Communication | 1 | 35 | 7 | (34) |
| 1240.20 | Dental Hygienist | 20 | 63 | 3 | (43) |
| 1701.00 | Mathematics, General | 0 | 61 | 22 | (60) |
| 1305.00 | Child Development/Early Care and Education | 29 | 105 | 1 | (76) |
| 2105.00 | Administration of Justice | 10 | 121 | 6 | (111) |
| 2105.00 | Administration of Justice | 10 | 125 | 7 | (115) |
| 2001.00 | Psychology, General | 0 | 117 | 10 | (117) |
| 401.00 | Biology, General | 1 | 163 | 88 | (162) |
| 2105.00 | Administration of Justice | 24 | 200 | 3 | (176) |
| 2201.00 | Social Sciences, General | 1 | 246 | 40 | (244) |
| 1230.00 | Nursing | 181 | 621 | 7 | (441) |

# Appendix 5: Detailed Employment Projections

Table A5.1 displays the occupations that align with one or more of CCC’s educational programs. The programs with which they align can be found in Table A2.1. Table A5.2 displays the occupations that align with one or more of the programs discussed in the analysis of potential new programs (Tables 2.3). Note that if an occupation appears in Table A5.1 it is usually not included in Table A5.2.

|  |
| --- |
| **Table A5.1: Detailed Employment Projections Related to Existing Programs** |
| SOC | Occupation | 2014 Jobs | 2019 Jobs | Change | PeCCCent Change | Projected Annual Openings |
| 11-1011 | Chief Executives |  1,008  |  1,039  | 31  | 3% | 30 |
| 11-1021 | General and Operations Managers |  7,708  |  8,225  | 517  | 7% | 255 |
| 11-2022 | Sales Managers |  1,544  |  1,610  | 66  | 4% | 47 |
| 11-3011 | Administrative Services Managers |  1,045  |  1,118  | 73  | 7% | 32 |
| 11-3021 | Computer and Information Systems Managers |  434  |  473  | 39  | 9% | 14 |
| 11-3051 | Industrial Production Managers |  805  |  817  | 12  | 1% | 19 |
| 11-3071 | Transportation, Storage, and Distribution Managers |  477  |  505  | 28  | 6% | 17 |
| 11-9013 | Farmers, Ranchers, and Other Agricultural Managers |  8,108  |  7,265  | (843) |  (10%) | 135 |
| 11-9021 | Construction Managers |  1,139  |  1,063  | (76) |  (7%) | 24 |
| 11-9121 | Natural Sciences Managers |  133  |  138  | 5  | 4% | 4 |
| 11-9151 | Social and Community Service Managers |  795  |  921  | 126  | 16% | 44 |
| 11-9199 | Managers, All Other |  1,977  |  2,008  | 31  | 2% | 53 |
| 13-1051 | Cost Estimators |  992  |  1,029  | 37  | 4% | 41 |
| 13-1111 | Management Analysts |  1,536  |  1,679  | 143  | 9% | 54 |
| 13-2011 | Accountants and Auditors |  3,688  |  3,924  | 236  | 6% | 161 |
| 13-2031 | Budget Analysts |  216  |  225  | 9  | 4% | 11 |
| 13-2041 | Credit Analysts |  154  |  152  | (2) |  (1%) | 4 |
| 13-2061 | Financial Examiners |  40  |  42  | 2  | 5% | 0 |
| 13-2081 | Tax Examiners and Collectors, and Revenue Agents |  1,757  |  1,743  | (14) |  (1%) | 61 |
| 13-2082 | Tax Preparers |  214  |  234  | 20  | 9% | 9 |
| 15-1111 | Computer and Information Research Scientists |  42  |  45  | 3  | 7% | 1 |
| 15-1121 | Computer Systems Analysts |  710  |  794  | 84  | 12% | 29 |
| 15-1122 | Information Security Analysts |  131  |  148  | 17  | 13% | 6 |
| 15-1131 | Computer Programmers |  375  |  391  | 16  | 4% | 14 |
| 15-1132 | Software Developers, Applications |  564  |  624  | 60  | 11% | 20 |
| 15-1133 | Software Developers, Systems Software |  253  |  288  | 35  | 14% | 11 |
| 15-1134 | Web Developers |  225  |  248  | 23  | 10% | 9 |
| 15-1141 | Database Administrators |  222  |  238  | 16  | 7% | 8 |
| 15-1142 | Network and Computer Systems Administrators |  578  |  635  | 57  | 10% | 22 |
| 15-1143 | Computer Network Architects |  120  |  136  | 16  | 13% | 6 |
| 15-1151 | Computer User Support Specialists |  1,320  |  1,461  | 141  | 11% | 51 |
| 15-1152 | Computer Network Support Specialists |  341  |  361  | 20  | 6% | 10 |
| 15-1199 | Computer Occupations, All Other |  371  |  384  | 13  | 4% | 9 |
| 15-2021 | Mathematicians |  <10  |  <10  | -- | -- | 0 |
| 15-2041 | Statisticians |  34  |  40  | 6  | 18% | 2 |
| 15-2099 | Mathematical Science Occupations, All Other |  <10  |  <10  | -- | -- | 0 |
| 17-2112 | Industrial Engineers |  275  |  296  | 21  | 8% | 13 |
| 17-3026 | Industrial Engineering Technicians |  59  |  62  | 3  | 5% | 2 |
| 17-3031 | Surveying and Mapping Technicians |  110  |  118  | 8  | 7% | 4 |
| 19-1011 | Animal Scientists |  49  |  50  | 1  | 2% | 2 |
| 19-1012 | Food Scientists and Technologists |  243  |  249  | 6  | 2% | 10 |
| 19-1013 | Soil and Plant Scientists |  128  |  134  | 6  | 5% | 6 |
| 19-1029 | Biological Scientists, All Other |  154  |  155  | 1  | 1% | 5 |
| 19-1031 | Conservation Scientists |  108  |  114  | 6  | 6% | 5 |
| 19-1032 | Foresters |  51  |  56  | 5  | 10% | 3 |
| 19-1099 | Life Scientists, All Other |  19  |  21  | 2  | 11% | 1 |
| 19-3031 | Clinical, Counseling, and School Psychologists |  1,241  |  1,316  | 75  | 6% | 50 |
| 19-3032 | Industrial-Organizational Psychologists |  <10  |  <10  | -- | -- | 0 |
| 19-3039 | Psychologists, All Other |  67  |  71  | 4  | 6% | 3 |
| 19-3099 | Social Scientists and Related Workers, All Other |  71  |  77  | 6  | 8% | 2 |
| 19-4011 | Agricultural and Food Science Technicians |  439  |  458  | 19  | 4% | 20 |
| 19-4061 | Social Science ReseaCCCh Assistants |  25  |  31  | 6  | 24% | 2 |
| 19-4093 | Forest and Conservation Technicians |  363  |  361  | (2) |  (1%) | 15 |
| 21-1093 | Social and Human Service Assistants |  2,230  |  2,476  | 246  | 11% | 112 |
| 25-1099 | Postsecondary Teachers |  4,570  |  5,080  | 510  | 11% | 176 |
| 25-2011 | Preschool Teachers, Except Special Education |  2,278  |  2,420  | 142  | 6% | 96 |
| 25-2012 | Kindergarten Teachers, Except Special Education |  1,310  |  1,420  | 110  | 8% | 61 |
| 25-2022 | Middle School Teachers, Except Special and Career/Technical Education |  2,818  |  3,070  | 252  | 9% | 116 |
| 25-2031 | Secondary School Teachers, Except Special and Career/Technical Education |  5,516  |  5,801  | 285  | 5% | 213 |
| 25-2051 | Special Education Teachers, Preschool |  207  |  223  | 16  | 8% | 7 |
| 25-2052 | Special Education Teachers, Kindergarten and Elementary School |  662  |  707  | 45  | 7% | 21 |
| 25-9021 | Farm and Home Management Advisors |  16  |  18  | 2  | 13% | 0 |
| 27-1011 | Art Directors |  137  |  138  | 1  | 1% | 4 |
| 27-1012 | Craft Artists |  81  |  79  | (2) |  (2%) | 2 |
| 27-1013 | Fine Artists, Including Painters, Sculptors, and Illustrators |  66  |  65  | (1) |  (2%) | 0 |
| 27-1014 | Multimedia Artists and Animators |  157  |  158  | 1  | 1% | 5 |
| 27-1019 | Artists and Related Workers, All Other |  55  |  54  | (1) |  (2%) | 1 |
| 27-1021 | Commercial and Industrial Designers |  62  |  64  | 2  | 3% | 2 |
| 27-1024 | Graphic Designers |  605  |  606  | 1  | 0% | 19 |
| 27-2022 | Coaches and Scouts |  662  |  719  | 57  | 9% | 32 |
| 27-2023 | Umpires, Referees, and Other Sports Officials |  69  |  73  | 4  | 6% | 3 |
| 27-2042 | Musicians and Singers |  527  |  533  | 6  | 1% | 17 |
| 27-3012 | Public Address System and Other Announcers |  36  |  38  | 2  | 6% | 1 |
| 27-3031 | Public Relations Specialists |  428  |  474  | 46  | 11% | 16 |
| 27-3043 | Writers and Authors |  297  |  306  | 9  | 3% | 9 |
| 27-3091 | Interpreters and Translators |  400  |  454  | 54  | 14% | 17 |
| 29-1141 | Registered Nurses |  10,324  |  11,609  | 1,285  | 12% | 474 |
| 29-2021 | Dental Hygienists |  716  |  777  | 61  | 9% | 32 |
| 29-2061 | Licensed Practical and Licensed Vocational Nurses |  2,627  |  2,985  | 358  | 14% | 142 |
| 31-1013 | Psychiatric Aides |  133  |  144  | 11  | 8% | 5 |
| 31-1014 | Nursing Assistants |  4,783  |  5,430  | 647  | 14% | 229 |
| 31-9091 | Dental Assistants |  1,619  |  1,705  | 86  | 5% | 52 |
| 31-9092 | Medical Assistants |  3,986  |  4,431  | 445  | 11% | 172 |
| 33-1012 | First-Line Supervisors of Police and Detectives |  370  |  397  | 27  | 7% | 17 |
| 33-3011 | Bailiffs |  <10  |  <10  | -- | -- | 0 |
| 33-3021 | Detectives and Criminal Investigators |  371  |  390  | 19  | 5% | 12 |
| 33-3051 | Police and Sheriff's Patrol Officers |  2,855  |  3,023  | 168  | 6% | 127 |
| 33-9021 | Private Detectives and Investigators |  118  |  135  | 17  | 14% | 7 |
| 33-9031 | Gaming Surveillance Officers and Gaming Investigators |  26  |  27  | 1  | 4% | 0 |
| 37-1011 | First-Line Supervisors of Housekeeping and Janitorial Workers |  733  |  795  | 62  | 8% | 32 |
| 37-1012 | First-Line Supervisors of Landscaping, Lawn Service, and Grounds keeping Workers |  684  |  733  | 49  | 7% | 18 |
| 37-3011 | Landscaping and Grounds keeping Workers |  6,190  |  6,695  | 505  | 8% | 266 |
| 37-3012 | Pesticide Handlers, Sprayers, and Applicators, Vegetation |  443  |  469  | 26  | 6% | 18 |
| 37-3019 | Grounds Maintenance Workers, All Other |  67  |  75  | 8  | 12% | 3 |
| 39-1011 | Gaming Supervisors |  107  |  108  | 1  | 1% | 3 |
| 39-1021 | First-Line Supervisors of Personal Service Workers |  697  |  756  | 59  | 8% | 27 |
| 39-9011 | Childcare Workers |  8,094  |  8,233  | 139  | 2% | 295 |
| 39-9031 | Fitness Trainers and Aerobics Instructors |  702  |  698  | (4) |  (1%) | 11 |
| 39-9032 | Recreation Workers |  1,289  |  1,431  | 142  | 11% | 45 |
| 43-3021 | Billing and Posting Clerks |  2,559  |  2,772  | 213  | 8% | 92 |
| 43-3031 | Bookkeeping, Accounting, and Auditing Clerks |  7,008  |  7,425  | 417  | 6% | 152 |
| 43-3041 | Gaming Cage Workers |  103  |  104  | 1  | 1% | 3 |
| 43-3051 | Payroll and Timekeeping Clerks |  1,066  |  1,125  | 59  | 6% | 36 |
| 43-3061 | Procurement Clerks |  306  |  320  | 14  | 5% | 14 |
| 43-4011 | Brokerage Clerks |  37  |  36  | (1) |  (3%) | 1 |
| 43-4021 | Correspondence Clerks |  26  |  27  | 1  | 4% | 1 |
| 43-4031 | Court, Municipal, and License Clerks |  700  |  752  | 52  | 7% | 22 |
| 43-4071 | File Clerks |  1,077  |  1,081  | 4  | 0% | 27 |
| 43-4151 | Order Clerks |  666  |  686  | 20  | 3% | 22 |
| 43-4161 | Human Resources Assistants, Except Payroll and Timekeeping |  686  |  704  | 18  | 3% | 21 |
| 43-4171 | Receptionists and Information Clerks |  4,009  |  4,302  | 293  | 7% | 172 |
| 43-4199 | Information and Record Clerks, All Other |  1,280  |  1,266  | (14) |  (1%) | 30 |
| 43-5011 | Cargo and Freight Agents |  146  |  163  | 17  | 12% | 8 |
| 43-5051 | Postal Service Clerks |  207  |  183  | (24) |  (12%) | 3 |
| 43-5052 | Postal Service Mail Carriers |  989  |  898  | (91) |  (9%) | 33 |
| 43-5053 | Postal Service Mail Sorters, Processors, and Processing Machine Operators |  250  |  226  | (24) |  (10%) | 1 |
| 43-5071 | Shipping, Receiving, and Traffic Clerks |  2,618  |  2,779  | 161  | 6% | 104 |
| 43-5111 | Weighers, Measurers, Checkers, and Samplers, Recordkeeping |  1,041  |  1,105  | 64  | 6% | 37 |
| 43-6011 | Executive Secretaries and Executive Administrative Assistants |  2,134  |  2,169  | 35  | 2% | 34 |
| 43-6013 | Medical Secretaries |  3,121  |  3,535  | 414  | 13% | 124 |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive |  8,759  |  9,475  | 716  | 8% | 258 |
| 43-9022 | Word Processors and Typists |  945  |  854  | (91) |  (10%) | 4 |
| 43-9041 | Insurance Claims and Policy Processing Clerks |  882  |  900  | 18  | 2% | 28 |
| 43-9051 | Mail Clerks and Mail Machine Operators, Except Postal Service |  872  |  773  | (99) |  (11%) | 19 |
| 43-9061 | Office Clerks, General |  11,172  |  11,795  | 623  | 6% | 370 |
| 43-9071 | Office Machine Operators, Except Computer |  154  |  150  | (4) |  (3%) | 4 |
| 43-9111 | Statistical Assistants |  17  |  19  | 2  | 12% | 1 |
| 43-9199 | Office and Administrative Support Workers, All Other |  3,621  |  3,701  | 80  | 2% | 120 |
| 45-2021 | Animal Breeders |  133  |  122  | (11) |  (8%) | 4 |
| 45-4011 | Forest and Conservation Workers |  200  |  224  | 24  | 12% | 9 |
| 49-2091 | Avionics Technicians |  86  |  101  | 15  | 17% | 5 |
| 49-2093 | Electrical and Electronics Installers and Repairers, Transportation Equipment |  55  |  59  | 4  | 7% | 2 |
| 49-2096 | Electronic Equipment Installers and Repairers, Motor Vehicles |  46  |  51  | 5  | 11% | 1 |
| 49-3011 | AiCCCraft Mechanics and Service Technicians |  648  |  752  | 104  | 16% | 41 |
| 49-3023 | Automotive Service Technicians and Mechanics |  2,993  |  3,092  | 99  | 3% | 104 |
| 49-3031 | Bus and Truck Mechanics and Diesel Engine Specialists |  1,285  |  1,364  | 79  | 6% | 45 |
| 49-3041 | Farm Equipment Mechanics and Service Technicians |  676  |  674  | (2) |  (0%) | 21 |
| 49-3042 | Mobile Heavy Equipment Mechanics, Except Engines |  824  |  838  | 14  | 2% | 28 |
| 51-2011 | Aircraft Structure, Surfaces, Rigging, and Systems Assemblers |  29  |  34  | 5  | 17% | 1 |
| 51-4021 | Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic |  246  |  257  | 11  | 4% | 7 |
| 51-4022 | Forging Machine Setters, Operators, and Tenders, Metal and Plastic |  20  |  21  | 1  | 5% | 1 |
| 51-4023 | Rolling Machine Setters, Operators, and Tenders, Metal and Plastic |  22  |  25  | 3  | 14% | 0 |
| 51-4031 | Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic |  250  |  262  | 12  | 5% | 5 |
| 51-4032 | Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic |  19  |  18  | (1) |  (5%) | 1 |
| 51-4033 | Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic |  73  |  72  | (1) |  (1%) | 0 |
| 51-4034 | Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic |  50  |  49  | (1) |  (2%) | 0 |
| 51-4035 | Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic |  61  |  59  | (2) |  (3%) | 1 |
| 51-4041 | Machinists |  577  |  631  | 54  | 9% | 26 |
| 51-4081 | Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic |  226  |  221  | (5) |  (2%) | 5 |
| 51-4121 | Welders, Cutters, Solderers, and Brazers |  1,123  |  1,128  | 5  | 0% | 33 |
| 51-4122 | Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders |  162  |  170  | 8  | 5% | 6 |
| 51-4191 | Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic |  15  |  17  | 2  | 13% | 1 |
| 51-4192 | Layout Workers, Metal and Plastic |  26  |  24  | (2) |  (8%) | 1 |
| 51-4193 | Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic |  68  |  68  | 0  | 0% | 2 |
| 51-4199 | Metal Workers and Plastic Workers, All Other |  46  |  52  | 6  | 13% | 0 |
| 51-8031 | Water and Wastewater Treatment Plant and System Operators |  499  |  530  | 31  | 6% | 24 |
| 51-9123 | Painting, Coating, and Decorating Workers |  98  |  91  | (7) |  (7%) | 1 |

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| **Table A5.2: Detailed Employment Projections Related to Potential Future Programs** |
| SOC | Title | 2014 Jobs | 2019 Jobs | Change | % Change | Projected Annual Openings |
| 13-1199 | Business Operations Specialists, All Other |  3,160  |  3,310  | 150  | 5% | 75 |
| 19-4031 | Chemical Technicians |  167  |  195  | 28  | 17% | 10 |
| 25-4031 | Library Technicians |  655  |  697  | 42  | 6% | 46 |
| 29-2012 | Medical and Clinical Laboratory Technicians |  510  |  600  | 90  | 18% | 33 |
| 29-2032 | Diagnostic Medical Sonographers |  203  |  252  | 49  | 24% | 13 |
| 31-9097 | Phlebotomists |  366  |  419  | 53  | 14% | 18 |
| 33-9092 | Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers |  568  |  589  | 21  | 4% | 44 |
| 43-5032 | Dispatchers, Except Police, Fire, and Ambulance |  999  |  1,090  | 91  | 9% | 49 |
| 45-2093 | Farmworkers, Farm, Ranch, and Aquacultural Animals |  2,600  |  2,495  | (105) |  (4%) | 82 |
| 47-2031 | Carpenters |  3,348  |  3,194  | (154) |  (5%) | 53 |
| 47-2111 | Electricians |  1,906  |  2,111  | 205  | 11% | 82 |
| 47-2181 | Roofers |  646  |  654  | 8  | 1% | 30 |
| 49-2022 | Telecommunications Equipment Installers and Repairers, Except Line Installers |  683  |  801  | 118  | 17% | 34 |
| 49-9041 | Industrial Machinery Mechanics |  1,442  |  1,678  | 236  | 16% | 94 |
| 49-9051 | Electrical Power-Line Installers and Repairers |  483  |  574  | 91  | 19% | 38 |
| 49-9052 | Telecommunications Line Installers and Repairers |  510  |  583  | 73  | 14% | 29 |
| 49-9062 | Medical Equipment Repairers |  122  |  152  | 30  | 25% | 10 |
| 49-9071 | Maintenance and Repair Workers, General |  5,436  |  5,838  | 402  | 7% | 191 |
| 51-1011 | First-Line Supervisors of Production and Operating Workers |  2,175  |  2,265  | 90  | 4% | 52 |
| 51-9111 | Packaging and Filling Machine Operators and Tenders |  2,146  |  2,386  | 240  | 11% | 102 |
| 53-3032 | Heavy and Tractor-Trailer Truck Drivers |  10,766  |  11,549  | 783  | 7% | 353 |
| 53-7051 | Industrial Truck and Tractor Operators |  3,896  |  3,949  | 53  | 1% | 106 |

1. The industry and occupation data presented in this report reflect the number of jobs by place of work, not by place of residence. However, the report does assess the commuting patterns of residents to determine where they live and work both within and outside of the region. [↑](#footnote-ref-1)
2. Note that because LQs represent regional employment relative to national employment, a decreasing LQ does not necessarily mean decreasing employment, and likewise an increasing LQ does not necessarily mean increasing employment. [↑](#footnote-ref-2)
3. LEHD is an innovative program that uses modern statistical and computing techniques to combine federal and state administrative data on employers and employees with core Census Bureau censuses and surveys while protecting the confidentiality of people and firms that provide the data. [↑](#footnote-ref-3)
4. The “some college” category includes individuals who attended college but did not successfully obtain a degree and individuals who have received a postsecondary vocational award or professional certification but did not receive an associate’s or bachelor’s degree. [↑](#footnote-ref-4)
5. The column labeled “% Change” in Table 1.8 refers to the proportional change, not to the percent change between 2009 and 2014. For example, if a category comprised 20% of the total adult population in 2009 and 25% of the total adult population in 2014, the proportional change is equal to the difference between the two values (in this example, 5%). [↑](#footnote-ref-5)
6. TOP codes are not as detailed as CIP codes (which this type of analysis typically uses), and the translation from CIP to TOP codes was on the back-end of the analysis. Therefore, there are some duplicate TOP codes and titles in each of the tables. The CIP codes were included next to the TOP titles in order to differentiate the programs. For the complete list of CIP codes and TOP codes, refer to Appendix 2 Table A2.2. [↑](#footnote-ref-6)
7. Data for RC has been reviewed for accuracy by RC and updated to reflect 2012-2014 completions. [↑](#footnote-ref-7)
8. See Appendix 1 for a description of the sources and processes of EMSI data. [↑](#footnote-ref-8)
9. Given the changing dynamics and need for more education in the existing workforce (i.e., skills-biased technology change in many occupations and industry sectors), this assumption is considered conservative. [↑](#footnote-ref-9)
10. Note this adjustment is performed on a program-by-program basis without consideration of individual colleges or training providers. Therefore, a single program offered at one large institution has no advantage over a group of similar programs offered a number of smaller educational providers provided that the aggregate output of the smaller schools is near the output of the single larger school. [↑](#footnote-ref-10)
11. These data come with inherent weaknesses. First, numbers are only available for institutions that participate in or are applicants for any federal financial assistance program authorized by the Higher Education Act (HEA). Also, IPEDS does not account for the fact that some people may receive multiple degrees or certifications, so when the number of degrees awarded exceeds the number of people receiving the degrees, the number of completers can be overstated. Nevertheless, this system is the best source for collecting data regarding a broad range of educational institutions. [↑](#footnote-ref-11)