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| GAP Analyses  Florida College System Council of Presidents  – Final Report | | | |  |
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|  | **Prepared for the**  **Florida College System Council of Presidents**  **Contracted by the** **Association of Florida Colleges (AFC)** | |  | |
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# Executive Summary

The Florida College System is one of the largest state supported college systems in the United States, consisting of 28 public community and state colleges in Florida. The Florida College System Council of Presidents (FCS COP), administered through the Association of Florida Colleges (AFC), coordinates and advocates on issues and matters of concern to Florida’s public college system.

In 2014-15, the Florida College System (FCS) 28 institutions served 813,838 students (350,000 FTE) and had a record 110,844 graduates. Those academic degrees awarded included: 32,271 Postsecondary Vocational Certificates, 70,861 Associate (AA and AS), and 6,776 Bachelor’s degrees. In addition, there were 716 Educator Preparation Institute (EPI) and 59 Certificates of Professional Preparation awarded.

In 2016, the FCS COP commissioned the Florida State University Center for Economic Forecasting and Analysis (FSU CEFA) to conduct a Gap and Economic Impact Analysis study in order to assess whether current college programs are adequately training and educating the local workforce in order to properly service the current and future needs of their respective regional economies.

FSU CEFA first examined the major industries and occupations, by region and projected growth in the near future, as well as the potential salaries of graduates from regional colleges, by program or specialization. The study also looked at whether new programs should be created to address the evolving needs of local economies including where those skills are oversupplied and in demand, and a statewide look at how the college system may be in a position to fill major workforce gaps.

Since 1990, the economic makeup of employment has changed significantly in the state. In earlier years, Manufacturing (NAICS 33), Wholesale Trade (NAICS 42), and Accommodation and Food Services (NAICS 72) dominated the labor market in Florida, whereas in more recent years, Administrative (NAICS 56) and Professional (NAICS 54), and some Construction (NAICS 23) sectors have prevailed in the Florida economy. Currently, the top three major economic sectors in Florida are: Waste Management and Remediation Services (NAICS 56[[1]](#footnote-1)), Retail Trade (NAICS 44-45), and Health Care and Social Assistance (NAICS 62). These economic sectors represent approximately 34.1 percent of the total employed in Florida as of 2015.

According to the DEO Employment Projections Data for 2015, educational attainment in Postsecondary Vocational, Associate Degrees, and Bachelor’s Degrees, were 35.9, 13.6 and 9.4 percent, respectively. Based on these three relevant educational attainment levels, 5,083,308 employees were represented. As projected by the Department of Economic Opportunity (DEO), this number will increase to 5,783,653 employees, in year 2023. The projected average annual job openings (to year 2023), including growth and replacement, are expected to be in the order of 189,534. The larger average annual employment demand, or needs, by occupation (SOC code), are expected to be in:

1. Office and Administrative Support (SOC 43);
2. Business and Financial Operations (SOC 13);
3. Healthcare Practitioners and Technical (SOC 29);
4. Education, Training, and Library (SOC 25);
5. Construction and Extraction (SOC 47), and;
6. Sales and Related (SOC 41).

Based on the SOC-CIP crosswalk, the average graduated student supply from the FCS institutions (over the three previous years) is 102,311 as opposed to the matched need of 164,684, leaving an identified gap or shortage, of 62,373 on an annual basis. The greatest difference, or gap, occurs in the presently offered programs at the respective colleges:

1. Business, Management, Marketing, and Related Support Services (CIP 52);
2. Business, Management, Marketing, and Related Support Services, and Other (CIP 52.9999);
3. International Business/Trade/ Commerce (CIP 52.1101);
4. Entrepreneurship/Entrepreneurial Studies (CIP 52.0701);
5. Accounting Technology/Technician and Bookkeeping (CIP 52.0302), and;
6. Business Administration and Management, General (CIP 52.0201).

2) Personal and Culinary Services (CIP 12); Culinary Arts/Chef Training (CIP 12.0503);

3) Public Administration and Social Service Professions (CIP 44); Public Administration

(CIP 44.0401);

4) Education (CIP 13); Technology Teacher Education/Industrial Arts Teacher (CIP 13.1309), and;

5) Construction Trades (CIP 46); Plumbing Technology/Plumber (CIP 46.0503).

Currently identified in oversupply are the student numbers graduating in:

1. Health Professions and Related Programs (CIP 51), and;
2. Homeland Security, Law Enforcement, Firefighting and Related Protective Services (CIP 43).

In order to gauge individual colleges perceptions regarding their respective area’s workforce and program development needs, FSU CEFA developed a survey that was distributed by the AFC to all 28 State College Institutional Research (IR)/Institutional Effectiveness (IE) Offices in early July, 2016. The following report provides a summary of responses given by the respective college’s IR/IE Offices. It should be noted that the individual college responses are available in their respective college-level reports.

The total economic impacts of the FCS of Florida in 2014-15, including economic multiplier effects arising from supply chain activity (indirect effects) and employee household spending (induced effects), are presented in the following Table. In summary, the FCS is an important contributor to Florida’s economy both directly and indirectly through spending for payroll, operations or expenses, capital improvements and student spending, and also through increased earnings and spending by graduates. In 2014-15 the total economic impacts of the Florida College System were estimated at $49.1 billion in output or revenues, $30.1 billion in value added (GDP), and 384,872 fulltime and part time jobs. This included significant impacts attributed to the projected earnings differentials (compared with high school graduates) by FCS graduates over a 30 year period of employment.

### Table ES1. Summary of Economic Impacts, by Economic Activity, of the Florida College System



Values in 2016 dollars. Sources: FCS financial data for revenues and expenditures, and IMPLAN software and state/county data.

# Introduction[[2]](#footnote-2)



Florida’s 28 locally–governed Florida College System institutions, created to respond to the state’s needs for accessible, affordable postsecondary academic and workforce education, are part of a comprehensive K-20 education system dedicated to providing a seamless academic pathway for students from pre-K through graduate school. While governed by local boards, the colleges operate under the jurisdiction of the State Board of Education, with administrative coordination provided by the Chancellor of the Division of Florida Colleges, who reports to the Commissioner of Education of the K-20 System.

Florida's colleges remain the primary point of access to higher education in Florida, with 65 percent of the state's high school graduates pursuing postsecondary education beginning at a Florida college, and 82 percent of freshman and sophomore minority students in public higher education attending one of Florida's 28 colleges. Florida colleges focus on local and regional workforce needs of employers as well as preparation for success in upper division studies.

FCS Institutions have open-door policies designed to meet the needs of Florida’s broad scope of citizens, from students who are the first in their families to attend college, to adults entering or re-entering college, to high achieving dual enrollment students getting a jump-start on postsecondary opportunities. Regardless of entering skill-level or career goal, the FCS is focused on providing the education necessary to elevating the skill level and earning power of those served by the FCS.

Articulation (“2 + 2”) in Florida is a legislatively created national model which ensures that students receive credit for comparable coursework without unnecessary repetition when transferring from one state institution to another. Florida has developed this statewide seamless articulation system, based upon a common core course numbering system, which facilitates efficient and effective progression and transfer of students between and among public postsecondary institutions. Articulation policy facilitates the following: Applied Technology Diploma to Associate in Applied Science (AAS) or Associate in Science (AS) degree; Postsecondary Adult Vocational (PSAV) to AAS/AS degree; Industry Certifications to AAS/AS Degree; AS degree to Baccalaureate degree; and AA degree to Baccalaureate degree transitions.

Many students enroll at Florida’s Colleges to retool and retrain during economic downturns as well as in periods of growth. A hallmark of the FCS is responsiveness in meeting the needs of businesses and industry as they embrace emerging technologies. The FCS have conveyed that they are more committed than ever to keeping doors open, and to helping students get the education they need to improve their lives and help boost the state’s economy.

The Association of Florida Colleges (AFC) provides administrative services and support to the Florida College System Council of Presidents (COP). Founded in 1949 by the presidents of Florida’s first four colleges, today all 28 of the state’s colleges support the work of the AFC, in addition to more than 7,000 individual college employee members. The AFC is organized through a network of Chapters, Commissions and Regions designed to provide professional development, leadership, and growth opportunities for all college employees.

In 2016, the COP commissioned the Florida State University Center for Economic Forecasting and Analysis (FSU CEFA) to conduct a Gap and Economic Impact Analysis study in order to assess whether current college programs are adequately training and educating the local workforce in order to properly service the current and future needs of their respective regional economies. FSU CEFA first examined the major industries and occupations, by region and their projected growth in the near future, as well as the potential salaries of graduates from regional colleges, by program or specialization. The study also looked at whether new programs should be created to address the evolving needs of local economies including where those skills are oversupplied and in demand, and a statewide look at how the college system may be in a position to fill major workforce gaps.

FSU CEFA developed a mapping tool (using the three-way crosswalk) matching the industry, occupation and program (i.e., the NAICS, SOC and CIP) codes in Florida, which provides a greater understanding of how existing area businesses are linked to the FCS. The research team also used the Regional Demand Occupations Lists generated by the Florida Department of Economic Opportunity (DEO) to identify the demand for labor by each occupation in Florida. The supply of graduates for each occupation by CIP code and college was obtained from the IPEDS College Navigator website. The research team next identified the following gaps: between the number of jobs demanded and the number of graduates supplied for each related occupation in the individual college, and State of Florida areas.

FSU CEFA compiled the gap summaries for each of the 28 individual FCS areas, in addition to a statewide report, and included programs that are oversupplying, and undersupplying (in demand) with respect to the market area. In addition, an economic impact analysis was performed of the impacts associated with the FCS, which is presented in the statewide report.

Following the Introduction and Literature Review sections, the report will first highlight the demographics and labor (or supply) markets of the FCS area. The labor supply markets include the short-term labor market dynamics, longer term structural changes, and employment by industry sectors (given that they set demand for employment) as well as provide an overall picture of educational attainment in Florida. In the second section, Florida’s employment demand is outlined, in terms of Standard Occupation Codes (SOC). In the third section, Florida’s employment demand is presented in terms of Classification of Instructional Programs (CIP) Codes. The gap analyses results are also presented and discussed in this section. The fourth section provides a summary of the results of a qualitative survey analysis of the FCS’s Institutional Research (IR)/Institutional Effectiveness (IE) Offices associated with the best management practices and processes involved with educational program development. The economic impact analysis and results are included in the fifth section. The last section includes the study’s conclusions with a discussion of the summary gap, program survey and economic impact results. The Appendices provide additional detail with respect to the Gap analysis findings by program code, and the Gap analysis methodology.

# Literature Review

The Florida College System continues to expand over time, in terms of enrollment and program offerings, and through a focus on building the diverse student population’s academic and jobs skill development to be in line with local workforce development needs and the latest advancements in emerging technologies. In a recent study of rankings of the nation’s colleges, Florida was ranked #4 for Best College System for 2016.[[3]](#footnote-3) Although Florida has recently risen to third in terms of population growth in the state, the #4 rank for the FCS is quite notable given the recent recession, where Florida was especially hard hit in the construction trades and tourism sectors, two industries strongly represented in the FCS program curricula.

The FCS performs extremely well in the area of student transfers between and among postsecondary institutions. Florida was recently ranked first in the nation, in terms of the “Transfer-With-Award-Rate (%)”, at 58 percent. In other words, Florida is doing extremely well in ensuring student transfers either have an associate’s degree or certificate in hand before transferring between or to another institution. Regarding the outcomes on all the institutional measures, Florida, Illinois, and New Jersey were among only three states that performed above the national average on all measures.[[4]](#footnote-4)

The FCS continues to expand their STEM and emerging technologies program offerings. The recent STEM profile report generated by Astra’s Global STEM & Innovation project, found that the number one STEM occupation projected in year 2025 was for SOC 11-9199 (Managers, All Other), which is a strong program currently reflected among the state colleges (#7 in terms of DEO projected average annual job openings). The median hourly wage for managers projected by the DEO, was $45.96, whereas the STEM profile report showed wages as much lower, at $20.09. The other top STEM fields projected are in: Accounting and Auditors, Postsecondary teachers and Business Operations Specialists (All Other), and First-Line Supervisors of Food Prep & Serving Workers. All four of these STEM fields are also currently projected as in demand occupations in Florida.

A recent study, involving a partnership between the State of Florida and College Measures, examined the median first-year earnings of recent graduates and completers from Florida’s public postsecondary education institutions including the SUS, FCS, and District Technical Centers. They found substantial differences in wage earnings among degrees and programs. They found that three of the four fastest growth industries were related to construction. Also, that the health care industry is projected to increase due to population growth, the aging population, and improved technologies. The authors also found that physical therapists were in high demand. Another finding was that Florida’s colleges and universities were set to produce fewer Securities and Financial Service Sales Agents than the projected demand, thereby resulting in a shortage of about 1,100 trained graduates.

There have been a number of Gap analysis studies that have been conducted recently in Florida. A few studies, in the Tampa Bay, Hillsborough and Pinellas county areas were performed by the respective CareerSource areas and the Florida High Tech Corridor Council. They focused on specific industries; namely the Manufacturing, IT, and Financial Services sectors. Another CareerSource study, involved Brevard, Central Florida, and Flagler/Volusia counties, and the Florida High Tech Corridor Council, performed a talent gap analysis. There was also a recent labor market analysis study involving IT and Advanced Manufacturing conducted by the University of West Florida, Greater Pensacola Chamber, CareerSource Florida, and Gulf Power for the Pensacola MSA. They examined the two industry clusters in terms of impacts and workforce. In 2015, the Florida Board of Governors (BOG) performed a supply/demand workforce gap study on health-related programs as part of an environmental scan of the BOG’s Health Initiative Committee. They examined 23 health-related occupations and found that the FDEO projected 6,979 annual openings for Registered Nurses, 357 annual openings for Nurse Practitioners, and 140 annual openings for Nurse Anesthetists from 2014 to 2022. In addition, Florida produced roughly 8,600 new Registered Nursing graduates, 580 new Nurse Practitioner graduates, and 140 new Nurse Anesthetist graduates in 2012-2013.

The Lumina Foundation uses a national set of metrics to measure their impact and measure progress to Year 2025. They focus on a set of four factors to increasing educational attainment, including: awareness, enrollment, persistence and completion. Each metric has a specific benchmark and target date. For example, they’ve increased the overall annual higher education completion rate to 57 percent (including 3 million awards) in 2015. There are 26 states that have set state attainment goals that meet the Lumina Foundation’s criteria for rigor and efficacy (i.e., that the goal is quantifiable, challenging, long term, addresses gaps, and is in statute and/or a strategic plan). They underscore the need for further development of pathways across the postsecondary system including certificates and certifications as a means for students to climb the “credential ladder”. Florida has recently (in late 2016) set a goal to meet Lumina’s criteria.[[5]](#footnote-5)

In 2016, the Florida Chamber found that in the last two decades, Florida has made significant strides in Florida’s education system by improving student learning and adopting effective education policies.[[6]](#footnote-6) They did find however, that Florida was still not globally competitive and must make improvements in becoming more innovative on a global-scale. They stated that the local businesses become advocates in their communities for promoting higher education standards, creative career and professional academies, student internships, and talent development.

# Florida College System Area Demographics and Labor (or Supply) Markets

The Florida College System (FCS), consists of 28 public community and state colleges in Florida, with a recent annual enrollment of 813,838 (350,000 FTE) students, and a record 110,844 graduates. Those academic degrees awarded included: 32,271 Postsecondary Vocational Certificates, 70,861 Associate (AA and AS), and 6,776 Bachelor’s degrees. In addition, there were 716 Educator Preparation Institute (EPI) and 59 Certificates of Professional Preparation awarded. The FCS totals 13,369 acres, with 2,106 owned buildings with a combined value of about $8 billion.

The Florida College System employed a total of 45,294 persons directly in 2015, not including temporary staff and student workers. Approximately 50 percent of the FCS employee population is faculty, with 6,156 full-time, and 16,309 part-time faculty. With regard to the student population, about 160,253 (or 35 percent), and 295,010 (or 65 percent) were full-time and part-time students, respectively.

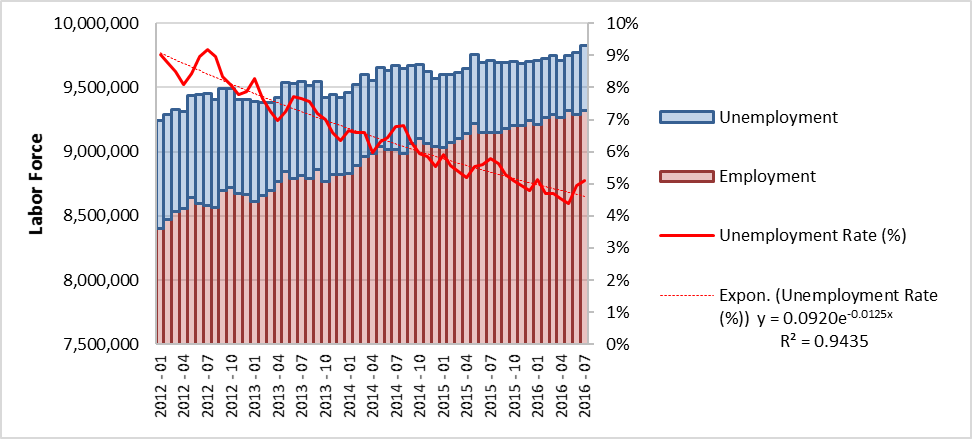
Expenditures or revenues by all state colleges-related entities, including general revenue, student fees and lottery funding totaled about $2 billion in 2014-15. Concerning the total expenditures, about 77 percent of the FCS budget is comprised of payroll (including full-time and part-time), 21 percent is in current expenses (e.g., utilities, office supplies, etc.) and 2 percent is in capital expenses. For Fall 2015, resident students have averaged $3,202 in tuition and fees, and non-resident students have averaged $11,686 for the lower level credit courses. For upper level credit programs, residents typically pay about $3,647 per semester, and non-resident students $15,424. Overall, the FCS student transfer-with-award rate of 58 percent is higher than any other state in the U.S.[[7]](#footnote-7)

Florida’s Colleges operate in 28 defined regions or “service areas” corresponding to 24 workforce regions in the state. To better understand the state, or FCS area, labor market conditions and college degree education, some general demographics and statistics are presented below.

According to the US Census[[8]](#footnote-8), Florida has an estimated population of 20,271,272 as of July 2015, showing an increase of 7.8 percent over the April 2010 base, which is equivalent to 1.4 percent annually. Persons under 18 years of age and 65 years of age and over, constitute about 40 percent of the estimated population. The civilian labor force for 2015 is estimated at 9,711,000[[9]](#footnote-9) or about 48 percent of the population 16 years of age and older. The percent of foreign born persons is about 20 percent. The total number of households is 7,217,508, with an average of 2.62 persons per household. Of persons 25 and older, about 87 percent have a high school diploma or higher, and about 27 percent have a Bachelor’s degree or higher. Median household income (in 2014 dollars) is $47,212, and median per capita income is $26,499. The mean travel time to work, for a worker age 16 years and over, is 26.1 minutes.

Figure 1 provides a general and short term view of Florida’s labor force; employment and unemployment, and the unemployment rate per month from January 2012 through July 2016.[[10]](#footnote-10)

**Figure 1. Florida Labor Force and Unemployment Rate January 2012 through July 2016**



From the underlying data, it is surmised that the labor force increases at a rate of approximately 1.4 percent annually. The number of employed increases at approximately 2.3 percent annually, hence, there is a decrease in unemployment of approximately 0.9 percentage points on an annual basis. Each and every college is working under this current premise, supplying students into a dynamic labor market, striving to meet demand both in number and quality.

Regardless of the shorter term dynamics shown, there is also an important longer term economic structure concerning the quality, or type of labor needed, that is addressed in this study. The project team utilized the DEO longer term FCS area employment projections (to year 2023) which took into account historical time-series data in the forecasting methodology. Table 1 depicts the relative employment shares and changes therein at the NAICS 2-digit industry code levels, ranging from years 1990 through 2013.[[11]](#footnote-11) Estimates for the years 2015 and 2023 are included in the last two columns. Indexing is applied to best represent the structural changes, this apart from changes associated with the increasing size of the National Establishment Time Series (NETS) Database over the years. The green highlights are applied per individual row; representing the change in employment share per year over time, thus to depict the share-shift in labor market dynamics.

**Table 1. Jobs and Job Changes by NAICS Sector in Florida for Years 1990 through 2013; 2015 and 2023 (Estimated)**



Source: The National Establishment Time Series (NETS) Database Release 2013; and DEO employment projections for 2023.

As shown in Table 1, the economic makeup of employment changed significantly in the FCS area since 1990. In earlier years, Manufacturing (NAICS 33), Wholesale Trade (NAICS 42), and Accommodation and Food Services (NAICS 72) dominated the labor market in Florida, whereas in more recent years, Administrative (NAICS 56) and Professional (NAICS 54), and some Construction (NAICS 23) sectors have prevailed in the Florida economy. The largest relative change is seen with the Management of Companies and Enterprises (NAICS 55) sector, albeit at a rather low share. A more sizable sector in terms of changes in employment is in Administrative and Support and Waste Management and Remediation Services (NAICS 56).

Currently, the top three major economic sectors in the FCS area are: Administrative and Support and Waste Management and Remediation Services (NAICS 56), Retail Trade (NAICS 44-45), and Health Care and Social Assistance (NAICS 62). Figure 2 shows employment estimates[[12]](#footnote-12) in the FCS area for year 2015 (by 2-digit NAICS Codes). The previously mentioned top three sectors represent about 34 percent of the total employed in 2015.

**Figure 2. Florida Estimated Employment by NAICS for the Year 2015**



Source: The National Establishment Time Series (NETS) Database Release 2013

Figure 3 presents the shares of educational attainment of the employed, in Florida.[[13]](#footnote-13) It should be noted that the current DEO data provides three FCS-specific educational attainment levels only. The recalibration is provided in the last column of Table 2b.[[14]](#footnote-14) Both Tables 2a and 2b illustrate that the FCS are responsible for presently feeding into, or supplying, a work force of 5.1 million (out of 8.6 million), while the current and projected annual or annual average college attainment need is 189,534 (out of a total need of 349,478).

**Figure 3. Florida Adult Population and Educational Attainment** **for the Year 2015**

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Table 2 presents the shares of educational attainment of the employed, in the Florida Workforce area, for years 2015 and 2023, as well as the annual average (over the eight years).[[15]](#footnote-15) The differences between Table 2a and 2b are due to marginal categories not included in the DEO Employment Projections, and growth and replacement differentials (per county/workforce area and per college service area respectively).[[16]](#footnote-16) The highlighted categories; Postsecondary Vocational, Associate Degree, and Bachelor’s Degrees are the relevant educational attainment levels for further Gap Analyses (i.e. 5,083,308 in total for 2015, and 189,534 in projected average annual demand post-2015).

**Table 2. Florida Workforce Data on Educational Attainment for Years 2015 and 2023 (Estimated)**



**Table 2b. Florida Workforce Data on College Educational Attainment Years 2015 and 2023 (Estimated)**



Figure 4 shows the employment levels and associated changes by 2-digit NAICS at the relevant educational attainment levels: Postsecondary Vocational, Associate and Bachelor’s degrees.[[17]](#footnote-17) The blue bars represent the number of jobs in 2015; the gray bars the estimated number of jobs in 2023, while the orange bars represent the average annual changes, or employment demand, between the two years 2015 and 2023. Figure 5 in the next section “Jobs by Occupation” shows a similar framework, with the blue bars representing the number of jobs in 2015, the gray bars the estimated number of jobs in 2023, and the orange bars representing the average annual changes per occupation, or Standard Occupation Code (SOC).

**Figure 4. Employment Levels and Associated Changes, or Demand by NAICS Sector, in Florida for Years 2015 and 2023 (Estimated)**

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Source: DEO Employment Projections (2015-2023), SOC to NAICS crosswalk and the National Establishment Time Series (NETS) Database Release 2013

Relating to employment, the Administrative and Support and Waste Management and Remediation Services (NAICS 56) is a strongly represented sector, followed next by Health Care and Social Assistance (NAICS 62), and Retail Trade (NAICS 44-45). In terms of average annual job growth, the top three sectors are Administrative and Support and Waste Management and Remediation Services (NAICS 56), Health Care and Social Assistance (NAICS62) and Professional, Scientific, and Technical Services (NAICS 54). The larger sectors, in terms of total employment, do not necessarily translate to being the largest in terms of labor demand.

As can be shown in Table 3, and relating to the previous three relevant educational attainment levels, there were 5,083,308 employees distributed over the twenty sectors (by NAICS code), in 2015. As projected by the Department of Economic Opportunity (DEO), this number will increase to 5,783,653 employees, in year 2023. Table 3 presents the data from DEO, using a cross-walk from SOC to NAICS.[[18]](#footnote-18) The average annual job openings are shown in the third column which represent the relevant employment demand (for the three educational attainment levels), which takes into account both annual changes in growth and replacement. The average annual change is also expressed as annual growth percentage and relative employment share, as per the years 2015 and 2023, in the last columns respectively.

**Table 3. Current and Projected Employment, Average Annual Job Openings, and Median Hourly Earnings by NAICS Industry Codes in Florida for Years 2015 and 2023**



Source: DEO Employment Projections (2015-2023), SOC to NAICS crosswalk and the National Establishment Time Series (NETS) Database Release 2013

The largest industries in terms of employment are Administrative and Support and Waste Management and Remediation Services (NAICS 56), followed by Health Care and Social Assistance (NAICS 62) and Retail Trade (NAICS 44-45). The ranking, according to the DEO’s expectation, doesn’t change between the two years. The most important number is the projected average annual job openings (i.e., a change of 189,534), also termed “employment demand”. The relative annual employment change may be a bit misleading when considered e.g. the annual growth in Management of Companies and Enterprises (NAICS 55), which constitutes only a small number, but the column does reflect an industry-by-industry relative need. The last two columns show the relative employment shares per industry, in 2015 and 2023, respectively. The higher shares are highlighted with green shading. The top three industries are illustrated by a solid green color.

# Jobs by Occupation (SOC)

The current and projected employment by Standard Occupation Group (SOC) codes, according to the relevant three educational attainment levels, is shown in Table 4. The annual average job openings are shown in the third column, followed by the relative annual changes. In addition, the 2015 Median Wages are shown in the last column.

**Table 4. Florida Current and Projected Employment per Standard Occupation Code (SOC) for Years 2015 and 2023**



Source: DEO Employment Projections (2015 and 2023)

The larger occupational needs, or specific employment demand, are expected to be in the Office and Administrative Support (SOC 43), Business and Financial Operations (SOC 13), Healthcare Practitioners and Technical (SOC 29). In addition, several other occupations such as Education, Training, and Library (SOC 25), Construction and Extraction (SOC 47), and Sales and Related (SOC 41) top the list in employment demand. As can be observed, the average annual employment or job openings, are rather spread more evenly as compared to the previous employment needs by Industry.[[19]](#footnote-19) The Median Wages for 2015 are shown in the last column and may reflect some year 2015 scarcity concerning the Management occupations (SOC 11), followed by specialties in Computer and Mathematical (SOC 15), and Architecture and Engineering (SOC 17).

Figure 5 depicts the average annual employment/job openings.[[20]](#footnote-20) While Office and Administrative Support occupations (SOC 43) are clearly in high demand for the area, there are five other occupations that top an annual average expectation on job openings, with over 12,500 jobs each and a total of 98,501 jobs annually between them. Those five other occupations are: Business and Financial Operations (SOC 13), Healthcare Practitioners and Technical (SOC 29), Education, Training, and Library (SOC 25), Construction and Extraction (SOC 47), and Sales and Related (SOC 41).

**Figure 5. Average Annual Job Openings, or Employment Demand, by SOC Code in Florida for Years 2015 to 2023**

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Source: DEO Employment Projections (2015-2023)

# Program GAP Analysis

The purpose of this Gap analysis is to highlight and communicate the workforce gap in Florida as it pertains to the FCS annual stream of graduates (supply) and the FCS educational programs offered (demand). 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 labor market gaps. Ultimately, the objective of this Gap analysis[[21]](#footnote-21) is to provide the respective colleges with information that may be used in decision-making concerning current and future educational program development.

The Classification of Instructional Programs (CIP) provides a taxonomic scheme that supports the accurate tracking and reporting of educational fields of study and program completion activities. To match the CIP to the SOC codes, the National Crosswalk Service Center SOC to CIP crosswalk was used.[[22]](#footnote-22) In applying the crosswalk, some data was lost due to missing codes (even when using the category: “No Related CIP” (i.e., CIP 99)). The average annual job openings is estimated to be 189,534 persons, however, only 164,684 (or about 87 percent) could be matched with one or more CIP codes.[[23]](#footnote-23)

Table 5 (and Figure 6) shows the average annual three-year (2011-2014) program completer or student graduates, i.e., the specific labor supply,[[24]](#footnote-24) for the FCS, by major program, or CIP code. As a means to provide the greatest representation over the available programs, the average graduate student numbers for academic years 2011-12, 2012-13 and 2013-14 were used.[[25]](#footnote-25) The total average number obtained for the FCS was 102,311 students annually (see Column 1). The total, spread over the various rows of the table, is kept constant at the same three-year average student counts per CIP. The second column in Table 5 represents the distribution of labor demand at 164,684 over the existing FCS offered programs.[[26]](#footnote-26) The third column shows the employment gap or deficit (taken as the difference between the first column as supply and the second as demand). Oversupply is denoted in positive numbers, and the gap, or undersupply, in negative numbers. The programs that show large gaps are highlighted in orange color shading. The last two columns refer to the same gap calculation, however, the research team also used an alternative approach. Instead of distributing the labor demand over the existing individual college programs only, the 164,684 in labor demand were distributed over ALL available programs (according to one or more matched CIP codes).[[27]](#footnote-27) The latter approach applies the distribution across substantially more programs across the FCS, which indicates that additional programs may be needed, from a statewide perspective. That said, it’s also realized that programs may not be offered for a few students only, that partial programs may be offered, or some programs may be offered under different program names. In short, these “across all programs” results provide a broader programmatic perspective.

**Table 5. Florida Average Annual Student Graduation, or Supply, and Average Annual Job Openings, or Employment Demand, to Year 2023; Two Alternative Scenarios**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2010 CIP Code** | **2010 CIP Title** | **Average Annual Student Graduation 2011-2014 (Supply)** | **DEO Average Annual Job Openings or Demand** | | | |
| **Present Offered Educational Programs**  **(Demand)** | **GAP, or Under-Supply in Programs** | **All Educational Programs**  **(Demand)** | **GAP, or Under-Supply in Programs** |
|  |  | **(1)** | **(2)** | **(3) = (1-2)** | **(4)** | **(5) = (1-4)** |
|  |  | **102,311** | **164,684** | ***(62,373)*** | **164,684** | ***(62,373)*** |
| 1 | Agriculture, Agriculture Operations, and Related Sciences | 222 | 2,048 | (1,826) | 3,759 | (3,537) |
| 3 | Natural Resources and Conservation | 69 | 77 | (8) | 286 | (217) |
| 4 | Architecture and Related Services | 58 | - | 58 | 585 | (527) |
| 5 | Area, Ethnic, Cultural, Gender, and Group Studies | - | - | - | - | - |
| 9 | Communication, Journalism, and Related Programs | 89 | 460 | (371) | 1,281 | (1,192) |
| 10 | Communications Technologies/Technicians and Support Services | 185 | 102 | 83 | 209 | (24) |
| 11 | Computer and Information Sciences and Support Services | 3,034 | - | 3,034 | 812 | 2,222 |
| 12 | Personal and Culinary Services | 1,162 | 20,671 | (19,509) | 7,095 | (5,933) |
| 13 | Education | 1,915 | 14,322 | (12,407) | 28,724 | (26,809) |
| 14 | Engineering | - | - | - | 6,182 | (6,182) |
| 15 | Engineering Technologies and Engineering-Related Fields | 1,989 | 485 | 1,504 | 3,035 | (1,046) |
| 16 | Foreign Languages, Literatures, and Linguistics | - | - | - | 3,207 | (3,207) |
| 19 | Family and Consumer Sciences/Human Sciences | 1,227 | - | 1,227 | 3,589 | (2,362) |
| 22 | Legal Professions and Studies | 690 | 950 | (260) | 454 | 236 |
| 23 | English Language and Literature/Letters | - | - | - | 386 | (386) |
| \*24 | Liberal arts And Sciences, General Studies and Humanities | 56,463 | - | 56,463 | 319 | 56,144 |
| 25 | Library Science | - | - | - | 184 | (184) |
| 26 | Biological and Biomedical Sciences | 418 | - | 418 | 1,068 | (650) |
| 27 | Mathematics and Statistics | - | - | - | 176 | (176) |
| 28 | Military Science, Leadership and Operational Art | - | - | - | - | - |
| 29 | Military Technologies and Applied Sciences | - | - | - | - | - |
| 30 | Multi/Interdisciplinary Studies | 1 | - | 1 | 1,268 | (1,267) |
| 31 | Parks, Recreation, Leisure, and Fitness Studies | 20 | - | 20 | 901 | (880) |
| 32 | Basic Skills and Developmental/Remedial Education | - | - | - | - | - |
|  |  |  |  |  |  |  |

\*Note:  This analysis does not include an analysis of CIP code 24 because the primary focus of students who earn an Associate in Arts degree is to transfer to colleges or universities to continue their education.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Table 5. Florida Average Annual Student Graduation, or Supply, and Average Annual Job Openings, or Employment Demand, to Year 2023; Two Alternative Scenarios, Cont.**  **Table 5. Florida Average Annual Student Graduation, or Supply, and Average Annual Job Openings, or Employment Demand, to Year 2023: Two Alternative Scenarios Cont.** | | | | | | |
| **2010**  **CIP**  **Code** | **2010 CIP Title** | **Average**  **Annual**  **Student**  **Graduation**  **2011-2014**  **(Supply)** | **DEO Average Annual Job Openings or Demand** | | | |
| **Present**  **Offered**  **Educational**  **Programs**  **(Demand)** | **GAP, or**  **Under-**  **Supply**  **in**  **Programs** | **All**  **Educational**  **Programs**  **(Demand)** | **GAP, or**  **Under-**  **Supply**  **in**  **Programs** |
|  |  | **(1)** | **(2)** | **(3) = (1-2)** | **(4)** | **(5) = (1-4)** |
| 33 | Citizenship Activities | - | - | - | - | - |
| 34 | Health-Related Knowledge and Skills | - | - | - | - | - |
| 35 | Interpersonal and Social Skills | - | - | - | - | - |
| 36 | Leisure and Recreational Activities | - | - | - | - | - |
| 37 | Personal Awareness and Self-Improvement | - | - | - | - | - |
| 38 | Philosophy and Religious Studies | - | - | - | 9 | (9) |
| 39 | Theology and Religious Vocations | - | - | - | 1,647 | (1,647) |
| 40 | Physical Sciences | - | - | - | 689 | (689) |
| 41 | Science Technologies/Technicians | 108 | - | 108 | 208 | (100) |
| 42 | Psychology | - | - | - | - | - |
| 43 | Homeland Security, Law Enforcement, Firefighting and Related Protective Services | 5,529 | 1,052 | 4,477 | 4,782 | 748 |
| 44 | Public Administration and Social Service Professions | 78 | 14,062 | (13,983) | 2,036 | (1,958) |
| 45 | Social Sciences | 0 | - | 0 | 108 | (108) |
| 46 | Construction Trades | 233 | 4,561 | (4,328) | 12,773 | (12,540) |
| 47 | Mechanic and Repair Technologies/Technicians | 1,060 | 3,759 | (2,699) | 4,182 | (3,122) |
| 48 | Precision Production | 7 | - | 7 | 13 | (6) |
| 49 | Transportation and Materials Moving | 607 | 9,929 | (9,322) | 2,197 | (1,590) |
| 50 | Visual and Performing Arts | 974 | 281 | 693 | 2,771 | (1,797) |
| 51 | Health Professions and Related Programs | 15,268 | 1,589 | 13,679 | 17,311 | (2,044) |
| 52 | Business, Management, Marketing, and Related Support Services | 10,782 | 90,172 | (79,391) | 50,437 | (39,656) |
| 53 | High School/Secondary Diplomas and Certificates | - | - | - | - | - |
| 54 | History | - | - | - | - | - |
| 60 | Residency Programs | - | - | - | - | - |
| 99 | No Related CIP | - | - | - | 1,492 | (1,492) |

As shown in Table 5, there are clear deficits (or gaps between supply and demand, equal to 62,373 annually), in the number of graduates; 102,311 in supply compared with the matched demand of 164,684 needed to fill positions. The starkest difference occurs in the category of Business, Management, Marketing, and Related Support Services (CIP 52). In Appendix 1 (Table 10), the CIP 52 is further delineated by subcategories, namely:[[28]](#footnote-28) Business, Management, Marketing, and Related Support Services, and Other (CIP 52.9999), International Business/Trade/Commerce (CIP 52.1101), Entrepreneurship/Entrepreneurial Studies (CIP 52.0701), Accounting Technology/Technician and Bookkeeping (CIP 52.0302), and Business Administration and Management, General (CIP 52.0201), according to presently offered programs. If examined from the “all program distribution” alternative scenario perspective, Appendix 1 (Table 7) shows a more diverse picture among potential CIP 52-programs, the top four being:[[29]](#footnote-29) Business, Management, Marketing, and Related Support Services, Other (CIP 52.9999), Business/Commerce, General (CIP 52.0101), Receptionist (CIP 52.0406), and Customer Service Support/Call Center/Teleservice Operation (CIP 52.0411). The second highest deficit occurs in: Personal and Culinary Services (CIP 12); in particular, Culinary Arts/Chef Training (CIP 12.0503). The third highest deficit is noted in Public Administration and Social Service Professions (CIP 44), where Public Administration (CIP 44.0401) stands out. A fourth large gap is noted in Education (CIP 13), where Technology Teacher Education/Industrial Arts Teacher (CIP 13.1309) stands out based on the distribution among present programs. Finally, a fifth gap is noted at Construction Trades (CIP 46), most notably in Plumbing Technology/Plumber (CIP 46.0503), which is also based on the distribution among present programs. The oversupply is shown, at least according to Table 5, in the numbers of students graduating in Health Professions and Related Programs (CIP 51), notably in Registered Nursing/Registered Nurse (CIP 51.3801) and Emergency Medical Technology/Technician (EMT Paramedic) (CIP 51.0904), and in Homeland Security, Law Enforcement, Firefighting and Related Protective Services (CIP 43).

Figure 6 depicts the same data as presented previously in Table 5. The blue bar represents the average number of graduating students in the academic years 2011-12, 2012-13 and 2013-14. The green bar represents the distribution of labor demand at 2,566 in total over the existing programs provided, and the red bar represents the employment needed (labor demand) distributed over all programs.

**Figure 6. Florida Average Annual Student Graduation, or Supply, and Average Annual Job Openings, or Employment Demand, to Year 2023: Two Alternative Scenarios**

|  |
| --- |
|  |

Note:  This analysis does not include an analysis of CIP code 24 because the primary focus of students who earn an Associate in Arts degree is to transfer to colleges or universities to continue their education, hence the entry N/A

**Figure 6. Florida Average Annual Student Graduation, or Supply, and Average Annual Job Openings, or Employment Demand, to Year 2023: Two Alternative Scenarios, Cont.**

|  |
| --- |
|  |

Table 6 represents an overview of the respective gaps of the individual colleges within Florida.[[30]](#footnote-30)

**Table 6. Florida Average Annual Student Graduation, or Supply, and Average Annual Job Openings, or Employment Demand, to Year 2023: Two Alternative Scenarios**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2010 CIP Code** | **2010 CIP Title** | **Average Annual Student Graduation 2011-2014 (supply)** | **DEO Average Annual Job Openings or Demand** | | | |
| **Present Offered Educational Programs (Demand)** | **All Educational Programs (Demand)** | **GAP, or Under-Supply in Programs** | **GAP, or Under-Supply in Programs** |
|  |  | **(1)** | **(2)** | **(4)** | **(3) = (1-2)** | **(5) = (1-4)** |
|  |  | **102,300** | **159,287** | | ***(56,987)*** | |
|  | **Broward College** | **8,271** | **15,286** | | ***(7,016)*** | |
|  | **College of Central Florida** | **1,840** | **2,566** | | ***(726)*** | |
|  | **Chipola College** | **592** | **490** | | ***103*** | |
|  | **Daytona State College** | **4,418** | **3,586** | | ***832*** | |
|  | **Eastern Florida State College** | **4,022** | **3,912** | | ***110*** | |
|  | **Florida SouthWestern State College** | **2,873** | **10,350** | | ***(7,477)*** | |
|  | **Florida Keys Community College** | **275** | **967** | | ***(692)*** | |
|  | **Florida State College at Jacksonville** | **8,094** | **10,287** | | ***(2,193)*** | |
|  | **Gulf Coast State College** | **1,279** | **1,407** | | ***(128)*** | |
|  | **Hillsborough Community College** | **5,344** | **13,429** | | ***(8,085)*** | |
|  | **Indian River State College** | **4,147** | **3,820** | | ***327*** | |
|  | **Florida Gateway College** | **762** | **592** | | ***170*** | |
|  | **Lake-Sumter State College** | **758** | **2,932** | | ***(2,174)*** | |
|  | **Miami Dade College** | **11,282** | **20,055** | | ***(8,773)*** | |
|  | **North Florida Community College** | **782** | **402** | | ***380*** | |
|  | **Northwest Florida State College** | **1,750** | **1,830** | | ***(80)*** | |
|  | **Palm Beach State College** | **6,103** | **12,164** | | ***(6,061)*** | |
|  | **Pasco-Hernando Community College** | **1,783** | **2,955** | | ***(1,172)*** | |
|  | **Pensacola State College** | **2,416** | **3,087** | | ***(671)*** | |
|  | **Polk State College** | **2,041** | **3,825** | | ***(1,784)*** | |
|  | **Santa Fe College** | **3,365** | **2,354** | | ***1,010*** | |
|  | **Seminole State College of Florida** | **5,465** | **4,301** | | ***1,164*** | |
|  | **South Florida State College** | **643** | **738** | | ***(95)*** | |
|  | **St. Johns River State College** | **1,287** | **2,624** | | ***(1,337)*** | |
|  | **St. Petersburg College** | **5,812** | **8,384** | | ***(2,572)*** | |
|  | **State College of Florida** | **1,768** | **6,247** | | ***(4,478)*** | |
|  | **Tallahassee Community College** | **3,321** | **2,783** | | ***538*** | |
|  | **Valencia College** | **11,806** | **17,914** | | ***(6,108)*** | |

As shown in Table 6, there are clear deficits (or gaps between supply and demand), in the number of graduates; 102,300 were supplied when compared to a demand needed of 159,287 (or a gap of 56,987).

# Survey Results

In order to gauge individual colleges perceptions regarding their respective area’s workforce and program development needs, a survey was developed and distributed to all 28 State College Institutional Research (IR)/Institutional Effectiveness (IE) Offices in early July, 2016. The survey instrument was developed by FSU CEFA staff with input from the FCS and a few FCS Administrators. The survey was created in Survey Monkey by AFC staff.[[31]](#footnote-31) The survey ended on August 8th with a 100 percent response rate from the colleges.

The Survey comprised 23 questions, about half of which contained check boxes, and CEFA staff provided comment boxes as well with each question in order for respondents to provide additional clarification, if needed. The remainder of other questions required open-ended responses. The focus of the survey was on qualitative issues relating to: state colleges program development, data collection and program evaluation, students’ job search, meeting labor market’s needs, communication with the Workforce Region, and perceptions regarding the role of the respective Office(s) of Institutional Research. Respondents answered, on average, 80 percent of each survey.

Based on the FCS IR/IE Offices survey results, this section provides a summary of responses given by the colleges. The survey answers resulted in responses pertaining to college-specific issues; hence only a selection of the questions is provided in this summary report.[[32]](#footnote-32) The following survey questions and responses were categorized and summarized for this report:

**Program Development Input and Feedback from FCS Students and Workforce**

In the process of building a program’s curriculum, there are various methods where input or feedback is solicited by the FCS stakeholders. One method the FCS uses is to distribute surveys to the students. The student feedback is primarily used for feedback on specific programs or program effectiveness, for purposes of accreditation, or to refine student learning goals in each curriculum. As such, it isn’t apparent from the results of this study survey, that student input is being currently utilized necessarily for new program development.

Concerning input and feedback from the community businesses, the FCS has a well-established networking system of advisory boards, councils, or committees in each FCS area. The FCS and advisory groups provide feedback on program development on a routine basis (at least semi-annually, or annually).

The typical advisory group members comprise: program managers, program faculty, employers, industry leaders, and/or representatives of the community's businesses, and CareerSource Florida. In addition, the FCS garner input or feedback on program development through employer (satisfaction) surveys. Lastly, FCS faculty and staff often serve and are active on community local workforce-related boards, and local Chambers of Commerce.

**Measurement and Evaluation of Existing FCS Programs**

The FCS measures and evaluates the existing FCS Programs through the following stakeholders: FCS AreaEmployers, Employees, Student/Graduates, Faculty, Advisory Boards/Councils, and via Program Reviews. Standard data measures collected annually by the FCS include: the Number of Program Majors, Number of Graduates & Completers, Programs Costs, Industry Certifications & Licensure, Job Placement Rates & Graduate Earnings, Enrollment & Retention, Average Class Size, Education Competencies (for AA Students with plans to transfer), Faculty Ratio, Modality of Courses and Course Success. Currently, it does not appear that other workforce-related measures; e.g., potential employment opportunities, community or workforce demand, etc., are being similarly collected as a standard performance measure of existing Programs at the FCS campuses. That said, the employer feedback survey is an important tool used by the FCS in measuring program effectiveness. Accreditation Standards and Benchmarking (with the State) were also listed as additional measures of program effectiveness in the FCS area.

**Data Sources and Collection Methods used in the FCS Program Development Process**

A number of colleges conduct feasibility analyses in conjunction with using the tool Economic Modeling Software Inc. (EMSI) to identify workforce demand, supply, and unmet need for graduates. In addition, the FCS also collect labor market data from data sources such as: the Florida Department of Economic Opportunity, the Florida Department of Education, Chambers of Commerce and Workforce/CareerSource Florida. Some colleges primarily use the Advisory Boards and/or Committees as the main source of information to determine which programs to start, stop and continue, justify budget requests and allocations, determine instructional delivery mode, and allot facility space and equipment. The colleges also mention that they utilize research and numerous points of contact (networking) which provides a continuous flow of information for the identification and development of new program areas, and for improvement of existing programs. Colleges collect this program-related research and/or information through partnering with various stakeholders and through hiring consultants to participate in Gap Analyses reports and profiles of community needs.

**Job Placement Offices at the FCS**

The FCS offers career services via a dedicated Career/Workforce Center (or equivalent), however, each FCS area offers different or varying ranges of career or job placement services. There is usually a resource person managing the job placement function at each Career/Workforce Center and a few colleges have a team of internship coordinators to secure internships and assist with placements. The FCS job placement office’s formal structure regarding the collaborative process with area businesses, and vice versa, involves participation with advisory boards/committees/councils. At some colleges, staff have roles on community boards/forums/chamber/workforce boards, while conversely, community business representatives serve on: e.g., the College Foundation Boards and District Board of Trustees. In addition, there are often Memorandum of Understanding (MOU’s) with various agencies, non-profits, and businesses in the community interested in partnering or working closely with the college (e.g., for purposes of internships, facilities design, construction, maintenance, food services, bookstore services, and student and employee services).

**State Colleges Institutional Research Roles and Responsibilities**

The study research team surveyed the FCS IR/IE Offices as to what their respective roles and responsibilities were. The survey results for this question will be further utilized in another publication (e.g., The Association for Institutional Research, among others).

**Suggestions and Recommendations by the FCS in Meeting Labor Market Demand in the Area**

There were numerous responses from the individual FCS IR/IE Offices, providing insightful suggestions and recommendations relating to their specific college area. A summary of those responses are outlined in the individual 28 state college reports.[[33]](#footnote-33) These responses can be categorized in three broad areas, including:

       *Provide targeted resources to start programs that meet industry needs.*  Examples of programs that could provide colleges the resources they need to meet industry needs.  The Legislature previously funded efforts of this type in the past including the Targeted Educational Attainment (TEAm) Grant program which consisted of $15 million to start new programs at the bachelor’s degree level in 2013.  Respondents suggest that such an approach, focused on subbaccalaureate credentials, is again needed.

       *Identify ways to increase access to workforce data.*  The Florida College System has worked closely with the Florida Department of Economic Opportunity to create the State College Projections Portal – a tool that aligns job projections with a college’s service area.  The Florida College System is nearing completion of a web tool that aids students as they choose their major.  This FindMyCollegeMajor.org application, in conjunction with CareerSource’s Market Intelligence Portal and efforts by the Department of Economic Opportunity provide a wealth of information to align workforce programs with the demands of employers. Further efforts to leverage technology and data are warranted.

       *Partner with business and industry to extend learn and earn opportunities.*  There is a clear understanding that advisory boards and other partnerships with employers can serve to both provide them with the workforce they need while also exposing potential students to the workforce programs college have available.  Efforts to engage with a greater number of industry-based professional organizations, a review program approval processes and requirements to identify greater efficiencies in the process, and expanding efforts to bring awareness to programs were identified by respondents.

# Economic Impact Analysis and Results

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# Economic Impact Analysis Methodology

# The total economic impacts of FCS-related spending was estimated with multipliers generated using a regional economic input-output model for the state of Florida constructed with the IMPLAN economic impact modeling system (IMPLAN Group, LLC, 2015). IMPLAN is a widely accepted integrated input-output model, used extensively by state and local government agencies to measure proposed legislative and other program and policy economic impacts across the private and public sectors. There are several advantages to using IMPLAN:

* It is calibrated to local conditions using a relatively large amount of local county level and state of Florida specific data;
* It is based on a strong theoretical foundation, and;
* It uses a well-researched and accepted applied economics impact assessment methodology supported by many years of use across all regions of the U.S.

The economic impact model used for this analysis was specifically developed for the counties of Florida, and includes 536 business sectors (based on the North American Industrial Classification System, or NAICS) and latest dataset – year 2015 data. IMPLAN’s principal advantage is that it may be used to estimate direct, indirect and induced economic impacts for any static (point-in-time) economic stimulus. Through the estimation of economic multipliers, the “ripple” effects of supply chain spending for input purchases are captured (indirect effects), and household spending by employees (induced effects) for new final demand to the regional economy, as well as direct spending and employment. Economic multipliers for each business sector and household income category are used to estimate the following economic impacts: economic output or revenue, employment (fulltime and part-time jobs), value added, labor-income, among other economic impacts.

# Economic Impact Model Input Data

The approach taken to this economic impact analysis was based on input data from the FCS expenditures for FY2014-15. This methodology is a standard approach that has been used in previous economic impact research studies on higher education in Florida and other states. Expenditures for FCS operations, personnel payroll, and capital improvements for fiscal year 2014-15, were taken from the FCS consolidated financial statements, with supplemental detail provided by the FCS financial staff. The input data used for the economic modeling process included FCS: college payroll operations, current expenses, capital outlay, student spending and recent graduate lifetime earnings. The respective expenditures were assigned to appropriate industry sector categories using NAICS, and further translated into IMPLAN-specific industry sectors in the economic impact model.

The economic impacts of increased earnings received by FCS graduates over their working lifetime, compared to Florida high school graduates were also estimated in this analysis. Data on employment and earnings for Florida FCS and high school graduates were obtained from the “Florida Educational Training Placement Information Program Outcomes Report” for Fall 2015 (FETPIP, 2015), which provides information for graduates in FY 2014-15. Additional reports were used to analyze information for graduates in academic years 2012-13, 2013-14, and 2014-15. This information is based upon matching of Social Security numbers for graduates to employer and school databases, rather than surveys of graduates, to determine the number of graduates who are employed or in continuing education in Florida. Reported earnings for employed graduates in the fourth quarter can be expressed as annual equivalent earnings. The reported earnings for Florida high school graduates were used as a baseline to compare the greater earnings of FCS graduates. The earnings differential for FCS graduates was projected over a 30 year period, representing a typical working lifetime.

The average lifetime earnings differential was computed using the U.S. Census Bureau earnings estimation methodology. This earnings estimation methodology was then expanded to reflect the total number of for 2014-15 FCS graduates who were fully employed in the Fall of 2015. This method assumes a median salary structure of employed Floridians (to educational attainment and age) rather than extrapolating graduate starting salaries from the previous five years’ salaries in the labor force. The analysis does not calculate present value (PV) of future incomes, but instead uses a salary structure or matrix. An advantage of the method is that no assumptions are needed for pricing adjustments or discount rates to use. Also, it reduces potential bias concerning the FETPIP sample (e.g. a selection bias, where the top graduating students are more likely to get timely job offers at likely higher wages). It also provides greater definition on age group cohorts: ages 25-34 years, 35-44 years, 45-54 years and 55-64 years. The lifetime earnings methodology did not account for the opportunity costs to FCS graduates associated with attendance at other colleges.

Regarding each of the expenditures, the study team estimated the amount of spending that was determined to be from in Florida or from out of state. Spending on goods and services imported from outside the State represents a “leakage” of money, and generates no impacts for the State’s economy. The share of spending inside of Florida was based on the State’s average percentage of total purchases of each particular good or service. These shares are known as regional purchase coefficients, which were econometrically estimated by the IMPLAN software based on the balance of supply and demand in the State for each product or service. The total economic contributions of FCS spending funded by new dollars represent the sum of the direct, indirect and induced effects multipliers applied to the portion of that spending that occurs inside the State. All expenditures for capital improvement projects were treated as new final demand, by definition. Expenses for asset depreciation, real property purchases and certain transfers were excluded from the analysis because these are non-cash expenses that do not represent final demand. The economic impact of spending by FCS employees was based upon typical household expenditure patterns for state public education workers. Student spending on tuition and on-campus housing was not included in the analysis since these dollars were captured by FCS revenues and spending. Sales by private vendors for campus food services, bookstores, and other concessions were not included in this analysis since their activity is captured in the spending of employees and students. Retail margins were applied to purchases of goods at retail stores by students and employees.

## **Graduate Employment and Earnings**

Median earnings Florida High School students and Florida students graduating with High school, some College or Associate’s degrees, and Bachelor’s degrees, according to the US Census, for years 2010 through 2015 are depicted in the following Figure.[[34]](#footnote-34) Regarding the previous six years, the average median annual per-capita earnings for all educational attainment levels have been rather flat, but for the last reporting year 2015. Relative to prior years, the average salary increase has been 16 percent for Bachelor’s degrees to $50,595 (from $43,657), while some College or Associate’s degrees gained 6.2 percent to $33,820 (from $31,442). These earnings are significantly higher than equivalent average earnings for students graduating with a high school diploma (with an annual average at $25,432).

### Figure 7. Median Per Capita Earnings in by Educational Attainment for the Population 25 Years and Over, Years 2010-2015

In order to evaluate the impacts of the Florida College System to the Florida economy, lifetime earnings were calculated for individuals based on median fulltime labor income earnings corresponding to educational attainment and age, as shown in the following Table. At the base of the table, the median income across age groups for each level of educational achievement is given as well. Estimates of FCS graduate lifetime earnings were made for a 30 year time horizon using U.S. Census wage information, double adjusted to educational attainment and age.

### Table 7. Median Annual Incomes for High School and Florida College System Graduates in Florida

|  |  |  |  |
| --- | --- | --- | --- |
| **Age (years)** | **High School** | **Some College or Assoc.** | **Bachelor’s** |
| 25-34 | $ 27,075 | $ 31,894 | $ 45,528 |
| 35-44 | $ 24,706 | $ 30,413 | $ 47,271 |
| 45-54 | $ 29,047 | $ 35,922 | $ 54,039 |
| 55-64 | $ 30,256 | $ 38,138 | $ 55,457 |
| Median | $ 28,094 | $ 33,948 | $ 50,715 |

Values in 2014 dollars. Annual earnings and Synthetic Work-life earnings are based on medians.

Sources: U.S. Census Bureau, American Community Survey, 2006-2008. U.S. Census Bureau, 2014 American Community Survey 1-Year Estimates. Median earnings in the past 12 months (in 2014 inflation-adjusted dollars) by sex by educational attainment for the population 25 years and over, Florida data retrieved from: <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_B20004&prodType=table>

In order to account for the differential among graduates’ income levels associated with varying degree programs, it was assumed that High School students enter the labor market at 18 years of age, some College or Associate’s at 20 years, and Bachelor’s recipients at 22 years of age. For each degree program, trend lines were estimated to derive the respective salaries at their year of graduation and in time intervals thereafter. Average median incomes by age group and degree level are provided in the following Table. The projected incomes over a lifetime were separated in ten year increments based on educational attainment as well as the lifetime income differential between high school graduates and college graduates at different levels of educational achievement. Over a 30 year period, an individual with, e.g. a Bachelor’s degree, is projected to earn an average of about $650,000 more than an individual with a High School degree. The “Some College or Associate’s” graduates are projected to earn an average of almost $170,000 more than an individual with a High School degree. The individual lifetime earnings by degree program are provided in the following Table. It is projected that graduates in each degree category will continue to add value to Florida’s economy by virtue of their lifetime earnings. It is estimated that the present value of lifetime earnings attributed to FCS graduates will total $19.497 billion over the next 30 years, or approximately $650 million annually in 2015 dollars (and at present student graduate levels).[[35]](#footnote-35)

### Table 8. Average Individual Lifetime Earnings for High School and Florida College System Graduates, and Differential with High School Graduates

|  |  |  |  |
| --- | --- | --- | --- |
| **Degree** | **Estimated Lifetime Earnings Over Time** | | |
| **10 Years** | **20 Years** | **30 Years** |
| High School | $ 244,761 | $ 508,301 | $ 785,463 |
| Some College or Associate’s | $ 288,994 | $ 609,602 | $ 953,612 |
| Bachelor’s | $ 435,641 | $ 917,640 | $ 1,434,566 |
| **Differential compared to high school graduates** | | | |
| Some College or Associate’s | $ 44,232 | $ 101,301 | $ 168,149 |
| Bachelor’s | $ 190,880 | $ 409,339 | $ 649,103 |

Regarding student spending, total costs (excluding tuition, and room and board) were estimated at $2.25 billion, including $442.5 million for books and supplies, $581 million for transportation, and $1.23 billion for other expenses. Spending by non-resident students, which represented new final demand to Florida, was $225 million, or about 10 percent of all student spending.[[36]](#footnote-36) It should be noted that expenditures for tuition and fees and on-campus room and board were not considered in the economic impact analysis to avoid double counting, because these dollars were accounted for in the FCS expense or operating costs.

## **Economic Impact Results and Conclusions**

The total economic impacts of the FCS of Florida in 2014-15, including regional economic multiplier effects arising from supply chain activity (indirect effects) and employee household spending (induced effects) for new final demand generated by FCS operations, capital improvements, student spending, and 30 year lifetime earnings differential of graduates, are summarized in the following Table. The industry output impacts were estimated at $49.1 billion, representing the sales revenues received for goods and services sold to the FCS and employees of related businesses. The total employment impacts were estimated at 384,872 fulltime and part-time jobs, representing 3.4 percent of the Florida workforce in 2015. The total value added impact of $30.1 billion represents the net value of total economic activity generated, and is also equivalent to 3.4 percent of the State Gross Domestic Product (GDP). Labor income impacts of $18.4 billion represented wages, salaries and benefits received by employees and business owners, or 3.8 percent of the state labor income.[[37]](#footnote-37)

### Table 9. Summary of Economic Impacts, by Economic Activity, of the Florida College System



Values in 2016 dollars. Sources: FCS financial data for revenues and expenditures; IMPLAN software and state/county data.

A large share of the total economic impact was attributed to the increased lifetime earnings of FCS graduates compared to high school graduates. It was assumed that these increased earnings would be spent within the state according to typical patterns prevailing for the Florida labor force. Fiscal year 2014-15 was the latest available information on graduate earnings. The estimated value of the 30 year lifetime earnings differential for FCS graduates was $19.6 billion. The total economic impacts of increased FCS graduate earnings were estimated at 285,938 fulltime and part-time jobs, $38.9 billion in industry output, $22.9 billion in value added (GDP), and $13.5 billion in labor income.

In summary, the FCS is an important contributor to Florida’s economy both directly and indirectly through spending for payroll, operations or expenses, capital improvements and student living expenses, and also through increased earnings and spending by graduates. In 2014-15 the total economic impacts of the Florida College System were estimated at $49.1 billion in output or revenues, $30.1 billion in value added (GDP), and 384,872 jobs. This included significant impacts attributed to the projected earnings differentials by FCS graduates over a 30 year period of employment.

# Conclusions

In 2016, the FCS COP commissioned the Florida State University Center for Economic Forecasting and Analysis (FSU CEFA) to conduct a Gap and Economic Impact Analysis study in order to assess whether current college programs are adequately training and educating the local workforce in order to properly service the current and future needs of their respective regional economies. FSU CEFA first examined the major industries and occupations, by region and projected growth in the near future, as well as the potential salaries of graduates from regional colleges, by program or specialization. The study also looked at whether new programs should be created to address the evolving needs of local economies including where those skills are oversupplied and in demand, and a statewide look at how the college system may be in a position to fill major workforce gaps.

Since 1990, the economic makeup of employment has changed significantly in the FCS area. In earlier years, Manufacturing (NAICS 33), Wholesale Trade (NAICS 42), and Accommodation and Food Services (NAICS 72) dominated the labor market in Florida, whereas in more recent years, Administrative (NAICS 56) and Professional (NAICS 54), and some Construction (NAICS 23) sectors have prevailed in the Florida economy. Currently, the top three major economic sectors in Florida are: Administrative and Support and Waste Management and Remediation Services (NAICS 56), Retail Trade (NAICS 44-45), and Health Care and Social Assistance (NAICS 62). These economic sectors represent approximately 34.1 percent of the total employed in Florida as of 2015.

According to the DEO Employment Projections Data for 2015, educational attainment in Postsecondary Vocational, Associate Degrees, and Bachelor’s Degrees, were 35.9, 13.6 and 9.4 percent, respectively. Based on these three relevant educational attainment levels, 5,083,308 employees were represented. As projected by the Department of Economic Opportunity (DEO), this number will increase to 5,783,653 employees, in year 2023.[[38]](#footnote-38) The projected average annual job openings (to year 2023), including growth and replacement, are expected to be in the order of 189,534. The larger average annual employment demand, or needs, by occupation (SOC code), are expected to be in Office and Administrative Support (SOC 43), Business and Financial Operations (SOC 13), Healthcare Practitioners and Technical (SOC 29). In addition, several other occupations such as Education, Training, and Library (SOC 25), Construction and Extraction (SOC 47), and Sales and Related (SOC 41) top the list in employment demand.

In applying the SOC-CIP crosswalk to the expected average annual demand of 189,534 employees, it is noted that only 164,684, or 86.9 (87) percent of the total employees, could be matched with a CIP code. Based on the SOC-CIP crosswalk, one can observe that the average graduate student supply from the Florida State Colleges (over the three previous years[[39]](#footnote-39)) is 102,311 as opposed to the matched need of 164,684,[[40]](#footnote-40) leaving an identified gap, or shortage, of 62,373 on an annual basis. The greatest difference, or gap, occurs in the current program offerings of the primary category: Business, Management, Marketing, and Related Support Services (CIP 52), and most notably in the subcategories[[41]](#footnote-41): Business, Management, Marketing, and Related Support Services, and Other (CIP 52.9999), International Business/Trade/ Commerce (CIP 52.1101), Entrepreneurship/Entrepreneurial Studies (CIP 52.0701), Accounting Technology/Technician and Bookkeeping (CIP 52.0302), and Business Administration and Management, General (CIP 52.0201), according to presently offered programs at the respective colleges. If examined from the alternative methodology of the “all program distribution” perspective presently offered across all the state colleges, the top four subcategories are:[[42]](#footnote-42) Business, Management, Marketing, and Related Support Services, Other (CIP 52.9999), Business/Commerce, General (CIP 52.0101), Receptionist (CIP 52.0406), and Customer Service Support/Call Center/Teleservice Operation (CIP 52.0411). The second highest gap occurs at Personal and Culinary Services (CIP 12); in particular, Culinary Arts/Chef Training (CIP 12.0503). The third highest deficit is noted in Public Administration and Social Service Professions (CIP 44), where Public Administration (CIP 44.0401) stands out based on the distribution among present programs. A fourth large gap is noted in Education (CIP 13), where Technology Teacher Education/Industrial Arts Teacher (CIP 13.1309) stands out based on the distribution among present programs. Finally, a fifth gap is noted at Construction Trades (CIP 46) in particular, Plumbing Technology/Plumber (CIP 46.0503), this also based on the distribution among present programs. Currently identified in oversupply, according to Table 5, are the number of students graduating in Health Professions and Related Programs (CIP 51), notably in Registered Nursing/Registered Nurse (CIP 513801) and Emergency Medical Technology/Technician (EMT Paramedic) (CIP 510904), and Homeland Security, Law Enforcement, Firefighting and Related Protective Services (CIP 43).

The findings of the entire FCS Gap Analysis are summarized in the following bullet points:

* Since 1990, Florida employment has shifted from Manufacturing (NAICS 33), to Administrative and Support and Waste Management and Remediation Services (NAICS 56), Retail Trade (NAICS 44-45), and Health Care and Social Assistance (NAICS 62) presently, employing approximately 34.1 percent of the Florida workforce.
* Employment Projections by DEO indicate a high demand for:

1. Office and Administrative Support (SOC 43);
2. Business and Financial Operations (SOC 13);
3. Healthcare Practitioners and Technical (SOC 29);
4. Education, Training, and Library (SOC 25);
5. Construction and Extraction (SOC 47), and;
6. Sales and Related (SOC 41).

* The FCS are projected to supply 189,534 graduates annually to year 2023 (out of an average of 349,478 annually needed in total).
* In applying the SOC-CIP crosswalk to the expected average annual demand of 189,534 employees, it is noted that only 164,684, or 86.9 percent of the total employees needed, could be matched with a CIP code.
* Given the identified demand for 164,684 College graduates, while the annual graduate supply is estimated at 102,311 (average 2011-2014), there is an identifiable gap of 62,373 on an annual basis.
* The annual gap, or deficit of 62,373, in employment supply was further analyzed using CIP coding.
* Currently identified in oversupply are the number of students graduating in:

1. Health Professions and Related Programs (CIP 51);
2. Registered Nursing/Registered Nurse (CIP 51.3801), and;
3. Emergency Medical Technology/Technician (EMT Paramedic) (CIP 51.0904).
4. Homeland Security, Law Enforcement, Firefighting and Related Protective Services (CIP 43).

* The largest gap based on current College educational program offerings are found in:

1. Business, Management, Marketing, and Related Support Services (CIP 52);
2. Business, Management, Marketing, and Related Support Services, and Other (CIP 52.9999);
3. International Business/Trade/ Commerce (CIP 52.1101);
4. Entrepreneurship/Entrepreneurial Studies (CIP 52.0701);
5. Accounting Technology/Technician and Bookkeeping (CIP 52.0302), and;
6. Business Administration and Management, General (CIP 52.0201).

2) Personal and Culinary Services (CIP 12); Culinary Arts/Chef Training (CIP 12.0503);

3) Public Administration and Social Service Professions (CIP 44); Public Administration

(CIP 44.0401);

4) Education (CIP 13); Technology Teacher Education/Industrial Arts Teacher (CIP 13.1309), and;

5) Construction Trades (CIP 46); Plumbing Technology/Plumber (CIP 46.0503)

In order to gauge individual colleges perceptions regarding their respective area’s workforce and program development needs, a survey was developed and distributed to all 28 State College Institutional Research (IR)/Institutional Effectiveness (IE) Offices in early July, 2016. Based on the FCS IR Offices survey results, this section provides a summary of responses given by the colleges. It should be noted that the individual college responses are available in their respective college-level reports.

In the process of building a program’s curriculum, there are various methods the input or feedback is solicited by the FCS stakeholders. One method the FCS uses is to distribute surveys to the students. The student feedback is primarily used for feedback on specific programs or program effectiveness, for purposes of accreditation, or to refine student learning goals in each curriculum. As such, it isn’t apparent from the results of this study survey, that student input is being currently utilized necessarily for new program development.

Concerning input and feedback from the community businesses, the state colleges have a well-established networking system of advisory boards, councils, or committees in each FCS area. The FCS and advisory groups provide feedback on program development on a routine basis (at least semi-annually, or annually).

The FCS measures and evaluates the existing FCS Programs through the following stakeholders: FCS AreaEmployers, Employees, Student/Graduates, Faculty, Advisory Boards/Councils, and via Program Reviews. Standard data measures collected annually by the FCS Number of Program Majors, Number of Graduates & Completers, Program Costs, Industry Certifications & Licensure, Job Placement Rates & Graduate Earnings, Enrollment & Retention, Average Class Size, Education Competencies (for AA Students with plans to transfer, Faculty Ratio, Modality of Courses and Course Success. Currently, it does not appear that other workforce-related measures; e.g., potential employment opportunities, community or workforce demand, etc., are being similarly collected as a standard performance measure of existing Programs at the FCS campuses. That said, the employer feedback survey is an important tool used by the FCS in measuring program effectiveness. Accreditation Standards and Benchmarking (with the State) were also listed as additional measures of program effectiveness in the FCS area.

Concerning the data sources used by the FCS IR/IE Offices, a number of colleges conduct feasibility analyses in conjunction with using the tool Economic Modeling Software Inc. (EMSI) to identify workforce demand, supply, and unmet need for graduates. In addition, the FCS also collect labor market data from data sources such as: the Florida Department of Economic Opportunity, the Florida Department of Education, Chambers of Commerce and Workforce/Career Source Florida. Some colleges primarily use the Advisory Boards and/or Committees as the main source of information to determine which programs to start, stop and continue, justify budget requests and allocations, determine instructional delivery mode, and allot facility space and equipment. The colleges also mention that they utilize research and numerous points of contact (networking) which provides a continuous flow of information for the identification and development of new program areas, and for improvement of existing programs Colleges collect this program-related research and/or information through partnering with various stakeholders and through hiring consultants to participate in Gap Analyses reports and profiles of community needs.

The FCS offers career services via a dedicated Career/Workforce Center (or equivalent); however, each FCS area offers different or varying ranges of career or job placement services. There is usually a resource person managing the job placement function at each Career/Workforce Center and a few colleges have a team of internship coordinators to secure internships and assist with placements.

The total economic impacts of the FCS in 2014-15, including regional economic multiplier effects arising from supply chain activity (indirect effects) and employee household spending (induced effects) for new final demand generated by FCS operations, capital improvements, student spending, and 30 year lifetime earnings differential of graduates, are summarized in the following Table. The industry output impacts were estimated at $49.1 billion, representing the sales revenues received for goods and services sold to the FCS and employees of related businesses. The total employment impacts were estimated at 384,872 fulltime and part-time jobs, representing 3.4 percent of the Florida workforce in 2015. The total value added impact of $30.1 billion represents the net value of total economic activity generated, and is also equivalent to 3.4 percent of the State Gross Domestic Product (GDP). Labor income impacts of $18.4 billion represented wages, salaries and benefits received by employees and business owners, or 3.8 percent of the state labor income.[[43]](#footnote-43)

### Table 10. Summary of Economic Impacts, by Economic Activity, of the Florida College System



Values in 2016 dollars. Sources: FCS financial data for revenues and expenditures, and IMPLAN software state & county data.

In summary, the FCS is an important contributor to Florida’s economy both directly and indirectly through spending for payroll, operations or expenses, capital improvements and student living expenses, and also through increased earnings and spending by graduates. In 2014-15, the total economic impacts of the Florida College System were estimated at $49.1 billion in output or revenues, $30.1 billion in value added (GDP), and 384,872 jobs. This included significant impacts attributed to the projected earnings differentials by FCS graduates over a 30 year period of employment.

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# Appendix 1. FCS Gap Analysis Supply and Demand; Years 2015 and 2023

**Table 10. Florida Detailed Average Annual Student Graduation, or Supply, and Average Annual Job Openings, or Employment Demand, to Year 2023: Two Alternative Scenarios**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2010 CIP Code** | **2010 CIP Title** | **Average Annual Student Graduates 2011-2014, or Supply** | **DEO Average Annual Job Openings, or Demand** | | | |
| **Present Offered Educational Programs**  **(Demand)** | **GAP, or Under-Supply in Programs** | **All Educational Programs**  **(Demand)** | **GAP, or Under-Supply in Programs** |
|  |  | **(1)** | **(2)** | **(3) = (1-2)** | **(4)** | **(5) = (1-4)** |
|  |  | **102,311** | **164,684** | **(62,373)** | **164,684** | **(62,373)** |
| 10000 | Agriculture, General | 3 | 107 | (104) | 14 | (10) |
| 10101 | Agricultural Business and Management, General | 4 | - | 4 | 4 | (1) |
| 10102 | Agribusiness/Agricultural Business Operations | - | - | - | 4 | (4) |
| 10103 | Agricultural Economics | - | - | - | 7 | (7) |
| 10104 | Farm/Farm and Ranch Management | - | - | - | 24 | (24) |
| 10105 | Agricultural/Farm Supplies Retailing and Wholesaling | - | - | - | 145 | (145) |
| 10106 | Agricultural Business Technology | - | - | - | 902 | (902) |
| 10199 | Agricultural Business and Management, Other | - | - | - | 19 | (19) |
| 10201 | Agricultural Mechanization, General | - | - | - | 11 | (11) |
| 10204 | Agricultural Power Machinery Operation | - | - | - | 36 | (36) |
| 10205 | Agricultural Mechanics and Equipment/Machine Technology | - | - | - | 177 | (177) |
| 10299 | Agricultural Mechanization, Other | 7 | - | 7 | 11 | (5) |
| 10301 | Agricultural Production Operations, General | - | - | - | 19 | (19) |
| 10302 | Animal/Livestock Husbandry and Production | - | - | - | 27 | (27) |
| 10303 | Aquaculture | 21 | - | 21 | 19 | 1 |
| 10304 | Crop Production | - | - | - | 27 | (27) |
| 10306 | Dairy Husbandry and Production | - | - | - | 15 | (15) |
| 10307 | Horse Husbandry/Equine Science and Management | - | - | - | 15 | (15) |
| 10399 | Agricultural Production Operations, Other | - | - | - | 19 | (19) |
| 10401 | Agricultural and Food Products Processing | - | - | - | 10 | (10) |
| 10505 | Animal Training | - | - | - | 4 | (4) |
| 10507 | Equestrian/Equine Studies | 24 | - | 24 | 4 | 20 |
| 10599 | Agricultural and Domestic Animal Services, Other | - | - | - | 4 | (4) |
| 10601 | Applied Horticulture/Horticulture Operations, General | - | - | - | 4 | (4) |
| 10603 | Ornamental Horticulture | - | - | - | 173 | (173) |
| 10604 | Greenhouse Operations and Management | - | - | - | 4 | (4) |
| 10605 | Landscaping and Groundskeeping | 94 | 970 | (876) | 222 | (128) |
| 10606 | Plant Nursery Operations and Management | - | - | - | 54 | (54) |
| 10607 | Turf and Turfgrass Management | 15 | 970 | (956) | 222 | (208) |
| 10608 | Floriculture/Floristry Operations and Management | - | - | - | 969 | (969) |
| 10699 | Applied Horticulture/Horticultural Business Services, Other | - | - | - | 4 | (4) |
| 10701 | International Agriculture | - | - | - | 8 | (8) |
| 10801 | Agricultural and Extension Education Services | - | - | - | 5 | (5) |
| 10802 | Agricultural Communication/Journalism | - | - | - | 220 | (220) |
| 10901 | Animal Sciences, General | - | - | - | 24 | (24) |
| 10902 | Agricultural Animal Breeding | - | - | - | 24 | (24) |
| 10903 | Animal Health | - | - | - | 6 | (6) |
| 10904 | Animal Nutrition | - | - | - | 29 | (29) |
| 10905 | Dairy Science | - | - | - | 24 | (24) |
| 10906 | Livestock Management | - | - | - | 19 | (19) |
| 10907 | Poultry Science | - | - | - | 21 | (21) |
| 10999 | Animal Sciences, Other | 52 | - | 52 | 6 | 46 |
| 11001 | Food Science | - | - | - | 33 | (33) |
| 11002 | Food Technology and Processing | - | - | - | 4 | (4) |
| 11101 | Plant Sciences, General | - | - | - | 25 | (25) |
| 11102 | Agronomy and Crop Science | - | - | - | 28 | (28) |
| 11103 | Horticultural Science | - | - | - | 10 | (10) |
| 11104 | Agricultural and Horticultural Plant Breeding | - | - | - | 10 | (10) |
| 11105 | Plant Protection and Integrated Pest Management | 3 | - | 3 | 10 | (7) |
| 11106 | Range Science and Management | - | - | - | 27 | (27) |
| 11199 | Plant Sciences, Other | - | - | - | 10 | (10) |
| 11201 | Soil Science and Agronomy, General | - | - | - | 10 | (10) |
| 11202 | Soil Chemistry and Physics | - | - | - | 5 | (5) |
| 11203 | Soil Microbiology | - | - | - | 5 | (5) |
| 19999 | Agriculture, Agriculture Operations, and Related Sciences, Other | - | - | - | 19 | (19) |
| 30101 | Natural Resources/Conservation, General | - | - | - | 8 | (8) |
| 30103 | Environmental Studies | - | - | - | 85 | (85) |
| 30104 | Environmental Science | 34 | - | 34 | 85 | (51) |
| 30201 | Natural Resources Management and Policy | - | - | - | 6 | (6) |
| 30205 | Water, Wetlands, and Marine Resources Management | - | - | - | 4 | (4) |
| 30206 | Land Use Planning and Management/Development | - | - | - | 4 | (4) |
| 30299 | Natural Resources Management and Policy, Other | 26 | 77 | (50) | 8 | 19 |
| 30301 | Fishing and Fisheries Sciences and Management | 1 | - | 1 | 15 | (14) |
| 30501 | Forestry, General | - | - | - | 8 | (8) |
| 30502 | Forest Sciences and Biology | - | - | - | 8 | (8) |
| 30506 | Forest Management/Forest Resources Management | - | - | - | 8 | (8) |
| 30508 | Urban Forestry | - | - | - | 6 | (6) |
| 30509 | Wood Science and Wood Products/Pulp and Paper Technology | - | - | - | 4 | (4) |
| 30510 | Forest Resources Production and Management | - | - | - | 6 | (6) |
| 30511 | Forest Technology/Technician | - | - | - | 2 | (2) |
| 30599 | Forestry, Other | - | - | - | 8 | (8) |
| 30601 | Wildlife, Fish and Wildlands Science and Management | 8 | - | 8 | 14 | (6) |
| 39999 | Natural Resources and Conservation, Other | - | - | - | 8 | (8) |
| 40201 | Architecture | - | - | - | 86 | (86) |
| 40301 | City/Urban, Community and Regional Planning | - | - | - | 118 | (118) |
| 40401 | Environmental Design/Architecture | - | - | - | 100 | (100) |
| 40501 | Interior Architecture | 34 | - | 34 | 151 | (117) |
| 40601 | Landscape Architecture | - | - | - | 100 | (100) |
| 40901 | Architectural Technology/Technician | 24 | - | 24 | 29 | (5) |
| 90101 | Speech Communication and Rhetoric | - | - | - | 138 | (138) |
| 90102 | Mass Communication/Media Studies | 3 | - | 3 | 100 | (96) |
| 90401 | Journalism | - | - | - | 103 | (103) |
| 90402 | Broadcast Journalism | 7 | 460 | (453) | 119 | (113) |
| 90404 | Photojournalism | - | - | - | 80 | (80) |
| 90499 | Journalism, Other | - | - | - | 23 | (23) |
| 90701 | Radio and Television | - | - | - | 87 | (87) |
| 90702 | Digital Communication and Media/Multimedia | 74 | - | 74 | - | 74 |
| 90902 | Public Relations/Image Management | - | - | - | 121 | (121) |
| 90903 | Advertising | - | - | - | 148 | (148) |
| 90904 | Political Communication | - | - | - | 117 | (117) |
| 90905 | Health Communication | - | - | - | 127 | (127) |
| 91001 | Publishing | - | - | - | 29 | (29) |
| 99999 | Communication, Journalism, and Related Programs, Other | 5 | - | 5 | 90 | (85) |
| 100105 | Communications Technology/Technician | 85 | - | 85 | 36 | 49 |
| 100201 | Photographic and Film/Video Technology/Technician and Assistant | 26 | - | 26 | 37 | (11) |
| 100202 | Radio and Television Broadcasting Technology/Technician | 28 | 102 | (74) | 25 | 3 |
| 100203 | Recording Arts Technology/Technician | - | - | - | 41 | (41) |
| 100299 | Audiovisual Communications Technologies/Technicians, Other | - | - | - | 40 | (40) |
| 100303 | Prepress/Desktop Publishing and Digital Imaging Design | 0 | - | 0 | 3 | (3) |
| 100304 | Animation, Interactive Technology, Video Graphics and Special Effects | 45 | - | 45 | 24 | 21 |
| 100399 | Graphic Communications, Other | - | - | - | 2 | (2) |
| 110101 | Computer and Information Sciences, General | - | - | - | 106 | (106) |
| 110103 | Information Technology | 748 | - | 748 | - | 748 |
| 110201 | Computer Programming/Programmer, General | 256 | - | 256 | 30 | 226 |
| 110202 | Computer Programming, Specific Applications | 191 | - | 191 | - | 191 |
| 110203 | Computer Programming, Vendor/Product Certification | 155 | - | 155 | - | 155 |
| 110301 | Data Processing and Data Processing Technology/Technician | - | - | - | 12 | (12) |
| 110401 | Information Science/Studies | - | - | - | 106 | (106) |
| 110501 | Computer Systems Analysis/Analyst | 232 | - | 232 | 24 | 208 |
| 110602 | Word Processing | - | - | - | 3 | (3) |
| 110701 | Computer Science | - | - | - | 106 | (106) |
| 110801 | Web Page, Digital/Multimedia and Information Resources Design | 165 | - | 165 | 183 | (18) |
| 110803 | Computer Graphics | 356 | - | 356 | 159 | 197 |
| 110901 | Computer Systems Networking and Telecommunications | 300 | - | 300 | - | 300 |
| 111001 | Network and System Administration/Administrator | 146 | - | 146 | 82 | 64 |
| 111002 | System, Networking, and LAN/WAN Management/Manager | 41 | - | 41 | - | 41 |
| 111003 | Computer and Information Systems Security/Information Assurance | 34 | - | 34 | - | 34 |
| 111005 |  | 8 |  | 8 |  | 8 |
| 111006 |  | 59 |  | 59 |  | 59 |
| 111099 | Computer/Information Technology Services Administration and Management, Other | 345 | - | 345 | - | 345 |
| 120301 | Funeral Service and Mortuary Science, General | 53 | - | 53 | 3 | 50 |
| 120302 | Funeral Direction/Service | - | - | - | 2 | (2) |
| 120303 | Mortuary Science and Embalming/Embalmer | - | - | - | 1 | (1) |
| 120401 | Cosmetology/Cosmetologist, General | 442 | 322 | 121 | 418 | 24 |
| 120402 | Barbering/Barber | 27 | - | 27 | 18 | 8 |
| 120404 | Electrolysis/Electrology and Electrolysis Technician | - | - | - | 359 | (359) |
| 120406 | Make-Up Artist/Specialist | - | - | - | 360 | (360) |
| 120407 | Hair Styling/Stylist and Hair Design | - | - | - | 377 | (377) |
| 120408 | Facial Treatment Specialist/Facialist | 158 | - | 158 | 42 | 115 |
| 120409 | Aesthetician/Esthetician and Skin Care Specialist | 3 | - | 3 | - | 3 |
| 120410 | Nail Technician/Specialist and Manicurist | 67 | - | 67 | 15 | 52 |
| 120411 | Permanent Cosmetics/Makeup and Tattooing | - | - | - | 360 | (360) |
| 120412 | Salon/Beauty Salon Management/Manager | - | - | - | 377 | (377) |
| 120413 | Cosmetology, Barber/Styling, and Nail Instructor | - | - | - | 377 | (377) |
| 120499 | Cosmetology and Related Personal Grooming Arts, Other | - | - | - | 359 | (359) |
| 120500 | Cooking and Related Culinary Arts, General | - | - | - | 1,864 | (1,864) |
| 120501 | Baking and Pastry Arts/Baker/Pastry Chef | 55 | - | 55 | 114 | (59) |
| 120503 | Culinary Arts/Chef Training | 163 | 20,349 | (20,186) | 1,090 | (927) |
| 120504 | Restaurant, Culinary, and Catering Management/Manager | 193 | - | 193 | 866 | (673) |
| 120505 | Food Preparation/Professional Cooking/Kitchen Assistant | 1 | - | 1 | 42 | (42) |
| 120506 | Meat Cutting/Meat Cutter | - | - | - | 3 | (3) |
| 120508 | Institutional Food Workers | - | - | - | 42 | (42) |
| 129999 | Personal and Culinary Services, Other | - | - | - | 1 | (1) |
| 130201 | Bilingual and Multilingual Education | - | - | - | 18 | (18) |
| 130202 | Multicultural Education | - | - | - | 18 | (18) |
| 130301 | Curriculum and Instruction | 3 | - | 3 | - | 3 |
| 130401 | Educational Leadership and Administration, General | - | - | - | 98 | (98) |
| 130402 | Administration of Special Education | - | - | - | 15 | (15) |
| 130403 | Adult and Continuing Education Administration | - | - | - | 15 | (15) |
| 130404 | Educational, Instructional, and Curriculum Supervision | - | - | - | 98 | (98) |
| 130406 | Higher Education/Higher Education Administration | - | - | - | 34 | (34) |
| 130407 | Community College Education | - | - | - | 19 | (19) |
| 130408 | Elementary and Middle School Administration/Principalship | - | - | - | 79 | (79) |
| 130409 | Secondary School Administration/Principalship | - | - | - | 53 | (53) |
| 130410 | Urban Education and Leadership | - | - | - | 15 | (15) |
| 130411 | Superintendency and Educational System Administration | - | - | - | 15 | (15) |
| 130499 | Educational Administration and Supervision, Other | - | - | - | 84 | (84) |
| 131001 | Special Education and Teaching, General | 211 | - | 211 | - | 211 |
| 131003 | Education/Teaching of Individuals with Hearing Impairments Including Deafness | 50 | - | 50 | 42 | 8 |
| 131201 | Adult and Continuing Education and Teaching | - | - | - | 187 | (187) |
| 131202 | Elementary Education and Teaching | 295 | - | 295 | 838 | (543) |
| 131203 | Junior High/Intermediate/Middle School Education and Teaching | - | - | - | 876 | (876) |
| 131205 | Secondary Education and Teaching | - | - | - | 495 | (495) |
| 131206 | Teacher Education, Multiple Levels | - | - | - | 1,332 | (1,332) |
| 131209 | Kindergarten/Preschool Education and Teaching | - | - | - | 450 | (450) |
| 131210 | Early Childhood Education and Teaching | 342 | 2,917 | (2,575) | 450 | (108) |
| 131299 | Teacher Education and Professional Development, Specific Levels and Methods, Other | 18 | - | 18 | - | 18 |
| 131301 | Agricultural Teacher Education | - | - | - | 571 | (571) |
| 131302 | Art Teacher Education | - | - | - | 876 | (876) |
| 131303 | Business Teacher Education | 1 | - | 1 | 613 | (613) |
| 131304 | Driver and Safety Teacher Education | - | - | - | 495 | (495) |
| 131305 | English/Language Arts Teacher Education | 7 | - | 7 | 876 | (869) |
| 131306 | Foreign Language Teacher Education | - | - | - | 876 | (876) |
| 131307 | Health Teacher Education | - | - | - | 876 | (876) |
| 131308 | Family and Consumer Sciences/Home Economics Teacher Education | - | - | - | 876 | (876) |
| 131309 | Technology Teacher Education/Industrial Arts Teacher Education | 1 | 11,406 | (11,405) | 1,034 | (1,034) |
| 131310 | Sales and Marketing Operations/Marketing and Distribution Teacher Education | - | - | - | 566 | (566) |
| 131311 | Mathematics Teacher Education | 54 | - | 54 | 876 | (822) |
| 131312 | Music Teacher Education | - | - | - | 876 | (876) |
| 131314 | Physical Education Teaching and Coaching | - | - | - | 876 | (876) |
| 131315 | Reading Teacher Education | - | - | - | 876 | (876) |
| 131316 | Science Teacher Education/General Science Teacher Education | 13 | - | 13 | 878 | (865) |
| 131317 | Social Science Teacher Education | - | - | - | 876 | (876) |
| 131318 | Social Studies Teacher Education | - | - | - | 876 | (876) |
| 131319 | Technical Teacher Education | - | - | - | 71 | (71) |
| 131320 | Trade and Industrial Teacher Education | - | - | - | 71 | (71) |
| 131321 | Computer Teacher Education | - | - | - | 876 | (876) |
| 131322 | Biology Teacher Education | 15 | - | 15 | 495 | (479) |
| 131323 | Chemistry Teacher Education | 0 | - | 0 | 495 | (494) |
| 131324 | Drama and Dance Teacher Education | - | - | - | 495 | (495) |
| 131325 | French Language Teacher Education | - | - | - | 495 | (495) |
| 131326 | German Language Teacher Education | - | - | - | 495 | (495) |
| 131327 | Health Occupations Teacher Education | - | - | - | 947 | (947) |
| 131328 | History Teacher Education | - | - | - | 876 | (876) |
| 131329 | Physics Teacher Education | - | - | - | 495 | (495) |
| 131330 | Spanish Language Teacher Education | - | - | - | 495 | (495) |
| 131331 | Speech Teacher Education | - | - | - | 495 | (495) |
| 131332 | Geography Teacher Education | - | - | - | 495 | (495) |
| 131333 | Latin Teacher Education | - | - | - | 495 | (495) |
| 131399 | Teacher Education and Professional Development, Specific Subject Areas, Other | - | - | - | 959 | (959) |
| 131401 | Teaching English as a Second or Foreign Language/ESL Language Instructor | - | - | - | 18 | (18) |
| 131501 | Teacher Assistant/Aide | 22 | - | 22 | 431 | (409) |
| 131502 | Adult Literacy Tutor/Instructor | - | - | - | 18 | (18) |
| 131599 | Teaching Assistants/Aides, Other | - | - | - | 431 | (431) |
| 139999 | Education, Other | 883 | - | 883 | 52 | 831 |
| 140101 | Engineering, General | - | - | - | 124 | (124) |
| 140201 | Aerospace, Aeronautical and Astronautical/Space Engineering | - | - | - | 110 | (110) |
| 140301 | Agricultural Engineering | - | - | - | 87 | (87) |
| 140401 | Architectural Engineering | - | - | - | 124 | (124) |
| 140501 | Bioengineering and Biomedical Engineering | - | - | - | 98 | (98) |
| 140601 | Ceramic Sciences and Engineering | - | - | - | 91 | (91) |
| 140701 | Chemical Engineering | - | - | - | 91 | (91) |
| 140801 | Civil Engineering, General | - | - | - | 257 | (257) |
| 140802 | Geotechnical and Geoenvironmental Engineering | - | - | - | 86 | (86) |
| 140803 | Structural Engineering | - | - | - | 86 | (86) |
| 140804 | Transportation and Highway Engineering | - | - | - | 257 | (257) |
| 140805 | Water Resources Engineering | - | - | - | 257 | (257) |
| 140899 | Civil Engineering, Other | - | - | - | 257 | (257) |
| 140901 | Computer Engineering, General | - | - | - | 105 | (105) |
| 140902 | Computer Hardware Engineering | - | - | - | 105 | (105) |
| 140903 | Computer Software Engineering | - | - | - | 86 | (86) |
| 140999 | Computer Engineering, Other | - | - | - | 86 | (86) |
| 141001 | Electrical and Electronics Engineering | - | - | - | 188 | (188) |
| 141101 | Engineering Mechanics | - | - | - | 124 | (124) |
| 141201 | Engineering Physics/Applied Physics | - | - | - | 124 | (124) |
| 141301 | Engineering Science | - | - | - | 124 | (124) |
| 141401 | Environmental/Environmental Health Engineering | - | - | - | 133 | (133) |
| 141801 | Materials Engineering | - | - | - | 356 | (356) |
| 141901 | Mechanical Engineering | - | - | - | 418 | (418) |
| 142001 | Metallurgical Engineering | - | - | - | 91 | (91) |
| 142101 | Mining and Mineral Engineering | - | - | - | 89 | (89) |
| 142201 | Naval Architecture and Marine Engineering | - | - | - | 93 | (93) |
| 142301 | Nuclear Engineering | - | - | - | 88 | (88) |
| 142401 | Ocean Engineering | - | - | - | 124 | (124) |
| 142501 | Petroleum Engineering | - | - | - | 86 | (86) |
| 142701 | Systems Engineering | - | - | - | 124 | (124) |
| 142801 | Textile Sciences and Engineering | - | - | - | 124 | (124) |
| 143201 | Polymer/Plastics Engineering | - | - | - | 124 | (124) |
| 143301 | Construction Engineering | - | - | - | 389 | (389) |
| 143401 | Forest Engineering | - | - | - | 124 | (124) |
| 143501 | Industrial Engineering | - | - | - | 182 | (182) |
| 143601 | Manufacturing Engineering | - | - | - | 389 | (389) |
| 143701 | Operations Research | - | - | - | 9 | (9) |
| 143801 | Surveying Engineering | - | - | - | 124 | (124) |
| 143901 | Geological/Geophysical Engineering | - | - | - | 124 | (124) |
| 149999 | Engineering, Other | - | - | - | 124 | (124) |
| 150000 | Engineering Technology, General | 105 | - | 105 | - | 105 |
| 150101 | Architectural Engineering Technology/Technician | 64 | - | 64 | 22 | 42 |
| 150201 | Civil Engineering Technology/Technician | 23 | - | 23 | 22 | 2 |
| 150303 | Electrical, Electronic and Communications Engineering Technology/Technician | 350 | - | 350 | 47 | 302 |
| 150304 | Laser and Optical Technology/Technician | 11 | - | 11 | 22 | (11) |
| 150305 | Telecommunications Technology/Technician | 115 | - | 115 | 47 | 67 |
| 150399 | Electrical and Electronic Engineering Technologies/Technicians, Other | - | - | - | 47 | (47) |
| 150401 | Biomedical Technology/Technician | 41 | - | 41 | 80 | (40) |
| 150403 | Electromechanical Technology/Electromechanical Engineering Technology | 3 | - | 3 | 7 | (4) |
| 150404 | Instrumentation Technology/Technician | - | - | - | 2 | (2) |
| 150405 | Robotics Technology/Technician | - | - | - | 7 | (7) |
| 150406 |  | 6 |  | 6 |  | 6 |
| 150499 | Electromechanical and Instrumentation and Maintenance Technologies/Technicians, Other | 1 | - | 1 | 9 | (8) |
| 150501 | Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician | 28 | - | 28 | 378 | (350) |
| 150503 | Energy Management and Systems Technology/Technician | 11 | - | 11 | 22 | (11) |
| 150505 | Solar Energy Technology/Technician | - | - | - | 400 | (400) |
| 150506 | Water Quality and Wastewater Treatment Management and Recycling Technology/Technician | 1 | - | 1 | 69 | (67) |
| 150507 | Environmental Engineering Technology/Environmental Technology | - | - | - | 9 | (9) |
| 150508 | Hazardous Materials Management and Waste Technology/Technician | - | - | - | 9 | (9) |
| 150599 | Environmental Control Technologies/Technicians, Other | 15 | - | 15 | 22 | (7) |
| 150607 | Plastics and Polymer Engineering Technology/Technician | - | - | - | 22 | (22) |
| 150611 | Metallurgical Technology/Technician | - | - | - | 22 | (22) |
| 150612 | Industrial Technology/Technician | 5 | - | 5 | 14 | (9) |
| 150613 | Manufacturing Engineering Technology/Technician | 5 | - | 5 | 14 | (9) |
| 150699 | Industrial Production Technologies/Technicians, Other | 24 | - | 24 | 14 | 11 |
| 150701 | Occupational Safety and Health Technology/Technician | - | - | - | 19 | (19) |
| 150702 | Quality Control Technology/Technician | 43 | - | 43 | - | 43 |
| 150703 | Industrial Safety Technology/Technician | - | - | - | 19 | (19) |
| 150704 | Hazardous Materials Information Systems Technology/Technician | - | - | - | 9 | (9) |
| 150799 | Quality Control and Safety Technologies/Technicians, Other | - | - | - | 19 | (19) |
| 150801 | Aeronautical/Aerospace Engineering Technology/Technician | 14 | - | 14 | - | 14 |
| 150803 | Automotive Engineering Technology/Technician | 118 | - | 118 | 506 | (388) |
| 150805 | Mechanical Engineering/Mechanical Technology/Technician | 21 | - | 21 | 9 | 12 |
| 150899 | Mechanical Engineering Related Technologies/Technicians, Other | 5 | - | 5 | 9 | (4) |
| 150901 | Mining Technology/Technician | - | - | - | 22 | (22) |
| 150999 | Mining and Petroleum Technologies/Technicians, Other | - | - | - | 22 | (22) |
| 151001 | Construction Engineering Technology/Technician | 100 | - | 100 | 701 | (600) |
| 151102 | Surveying Technology/Surveying | 0 | 485 | (485) | 86 | (86) |
| 151103 | Hydraulics and Fluid Power Technology/Technician | - | - | - | 22 | (22) |
| 151201 | Computer Engineering Technology/Technician | 86 | - | 86 | 47 | 38 |
| 151202 | Computer Technology/Computer Systems Technology | 285 | - | 285 | 47 | 237 |
| 151301 | Drafting and Design Technology/Technician, General | 261 | - | 261 | 38 | 223 |
| 151302 | CAD/CADD Drafting and/or Design Technology/Technician | 198 | - | 198 | 29 | 169 |
| 151303 | Architectural Drafting and Architectural CAD/CADD | 5 | - | 5 | 29 | (25) |
| 151304 | Civil Drafting and Civil Engineering CAD/CADD | 2 | - | 2 | 29 | (28) |
| 151305 | Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD | - | - | - | 9 | (9) |
| 151306 | Mechanical Drafting and Mechanical Drafting CAD/CADD | 2 | - | 2 | 8 | (5) |
| 151399 | Drafting/Design Engineering Technologies/Technicians, Other | - | - | - | 9 | (9) |
| 151401 | Nuclear Engineering Technology/Technician | - | - | - | 3 | (3) |
| 151501 | Engineering/Industrial Management | - | - | - | 14 | (14) |
| 159999 | Engineering Technologies and Engineering-Related Fields, Other | 41 | - | 41 | 22 | 19 |
| 160101 | Foreign Languages and Literatures, General | - | - | - | 42 | (42) |
| 160102 | Linguistics | - | - | - | 42 | (42) |
| 160103 | Language Interpretation and Translation | - | - | - | 42 | (42) |
| 160201 | African Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 160300 | East Asian Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 160301 | Chinese Language and Literature | - | - | - | 42 | (42) |
| 160302 | Japanese Language and Literature | - | - | - | 42 | (42) |
| 160303 | Korean Language and Literature | - | - | - | 42 | (42) |
| 160304 | Tibetan Language and Literature | - | - | - | 42 | (42) |
| 160399 | East Asian Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 160400 | Slavic Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 160401 | Baltic Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 160402 | Russian Language and Literature | - | - | - | 42 | (42) |
| 160404 | Albanian Language and Literature | - | - | - | 42 | (42) |
| 160405 | Bulgarian Language and Literature | - | - | - | 42 | (42) |
| 160406 | Czech Language and Literature | - | - | - | 42 | (42) |
| 160407 | Polish Language and Literature | - | - | - | 42 | (42) |
| 160408 | Bosnian, Serbian, and Croatian Languages and Literatures | - | - | - | 42 | (42) |
| 160409 | Slovak Language and Literature | - | - | - | 42 | (42) |
| 160410 | Ukrainian Language and Literature | - | - | - | 42 | (42) |
| 160499 | Slavic, Baltic, and Albanian Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 160500 | Germanic Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 160501 | German Language and Literature | - | - | - | 42 | (42) |
| 160502 | Scandinavian Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 160503 | Danish Language and Literature | - | - | - | 42 | (42) |
| 160504 | Dutch/Flemish Language and Literature | - | - | - | 42 | (42) |
| 160505 | Norwegian Language and Literature | - | - | - | 42 | (42) |
| 160506 | Swedish Language and Literature | - | - | - | 42 | (42) |
| 160599 | Germanic Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 160601 | Modern Greek Language and Literature | - | - | - | 42 | (42) |
| 160700 | South Asian Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 160701 | Hindi Language and Literature | - | - | - | 42 | (42) |
| 160702 | Sanskrit and Classical Indian Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 160704 | Bengali Language and Literature | - | - | - | 42 | (42) |
| 160705 | Punjabi Language and Literature | - | - | - | 42 | (42) |
| 160706 | Tamil Language and Literature | - | - | - | 42 | (42) |
| 160707 | Urdu Language and Literature | - | - | - | 42 | (42) |
| 160799 | South Asian Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 160801 | Iranian Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 160900 | Romance Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 160901 | French Language and Literature | - | - | - | 42 | (42) |
| 160902 | Italian Language and Literature | - | - | - | 42 | (42) |
| 160904 | Portuguese Language and Literature | - | - | - | 42 | (42) |
| 160905 | Spanish Language and Literature | - | - | - | 42 | (42) |
| 160906 | Romanian Language and Literature | - | - | - | 42 | (42) |
| 160907 | Catalan Language and Literature | - | - | - | 42 | (42) |
| 160999 | Romance Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 161001 | American Indian/Native American Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 161100 | Middle/Near Eastern and Semitic Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 161101 | Arabic Language and Literature | - | - | - | 42 | (42) |
| 161102 | Hebrew Language and Literature | - | - | - | 42 | (42) |
| 161103 | Ancient Near Eastern and Biblical Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 161199 | Middle/Near Eastern and Semitic Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 161200 | Classics and Classical Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 161202 | Ancient/Classical Greek Language and Literature | - | - | - | 42 | (42) |
| 161203 | Latin Language and Literature | - | - | - | 42 | (42) |
| 161299 | Classics and Classical Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 161301 | Celtic Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 161400 | Southeast Asian Languages, Literatures, and Linguistics, General | - | - | - | 42 | (42) |
| 161401 | Australian/Oceanic/Pacific Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 161402 | Indonesian/Malay Languages and Literatures | - | - | - | 42 | (42) |
| 161403 | Burmese Language and Literature | - | - | - | 42 | (42) |
| 161404 | Filipino/Tagalog Language and Literature | - | - | - | 42 | (42) |
| 161405 | Khmer/Cambodian Language and Literature | - | - | - | 42 | (42) |
| 161406 | Lao Language and Literature | - | - | - | 42 | (42) |
| 161407 | Thai Language and Literature | - | - | - | 42 | (42) |
| 161408 | Vietnamese Language and Literature | - | - | - | 42 | (42) |
| 161499 | Southeast Asian and Australasian/Pacific Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 161501 | Turkish Language and Literature | - | - | - | 42 | (42) |
| 161502 | Uralic Languages, Literatures, and Linguistics | - | - | - | 42 | (42) |
| 161503 | Hungarian/Magyar Language and Literature | - | - | - | 42 | (42) |
| 161504 | Mongolian Language and Literature | - | - | - | 42 | (42) |
| 161599 | Turkic, Uralic-Altaic, Caucasian, and Central Asian Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 161601 | American Sign Language (ASL) | - | - | - | 42 | (42) |
| 161603 | Sign Language Interpretation and Translation | - | - | - | 42 | (42) |
| 169999 | Foreign Languages, Literatures, and Linguistics, Other | - | - | - | 42 | (42) |
| 190101 | Family and Consumer Sciences/Human Sciences, General | - | - | - | 5 | (5) |
| 190201 | Business Family and Consumer Sciences/Human Sciences | - | - | - | 5 | (5) |
| 190202 | Family and Consumer Sciences/Human Sciences Communication | - | - | - | 164 | (164) |
| 190203 | Consumer Merchandising/Retailing Management | - | - | - | 1,157 | (1,157) |
| 190401 | Family Resource Management Studies, General | - | - | - | 5 | (5) |
| 190402 | Consumer Economics | - | - | - | 5 | (5) |
| 190403 | Consumer Services and Advocacy | - | - | - | 5 | (5) |
| 190499 | Family and Consumer Economics and Related Services, Other | - | - | - | 5 | (5) |
| 190501 | Foods, Nutrition, and Wellness Studies, General | - | - | - | 34 | (34) |
| 190504 | Human Nutrition | - | - | - | 27 | (27) |
| 190505 | Foodservice Systems Administration/Management | 4 | - | 4 | 802 | (798) |
| 190599 | Foods, Nutrition, and Related Services, Other | - | - | - | 27 | (27) |
| 190601 | Housing and Human Environments, General | - | - | - | 5 | (5) |
| 190604 | Facilities Planning and Management | - | - | - | 64 | (64) |
| 190605 | Home Furnishings and Equipment Installers | - | - | - | 49 | (49) |
| 190699 | Housing and Human Environments, Other | - | - | - | 5 | (5) |
| 190702 | Adult Development and Aging | - | - | - | 5 | (5) |
| 190704 | Family Systems | - | - | - | 5 | (5) |
| 190706 | Child Development | - | - | - | 5 | (5) |
| 190707 | Family and Community Services | - | - | - | 5 | (5) |
| 190708 | Child Care and Support Services Management | 130 | - | 130 | 301 | (171) |
| 190709 | Child Care Provider/Assistant | 1,093 | - | 1,093 | 696 | 398 |
| 190799 | Human Development, Family Studies, and Related Services, Other | - | - | - | 5 | (5) |
| 190901 | Apparel and Textiles, General | - | - | - | 5 | (5) |
| 190902 | Apparel and Textile Manufacture | - | - | - | 4 | (4) |
| 190904 | Textile Science | - | - | - | 68 | (68) |
| 190905 | Apparel and Textile Marketing Management | - | - | - | 117 | (117) |
| 190906 | Fashion and Fabric Consultant | - | - | - | 3 | (3) |
| 199999 | Family and Consumer Sciences/Human Sciences, Other | - | - | - | 5 | (5) |
| 220101 | Law | - | - | - | 6 | (6) |
| 220301 | Legal Administrative Assistant/Secretary | 1 | - | 1 | 65 | (64) |
| 220302 | Legal Assistant/Paralegal | 689 | 950 | (261) | 363 | 326 |
| 220303 | Court Reporting/Court Reporter | 0 | - | 0 | 14 | (13) |
| 229999 | Legal Professions and Studies, Other | - | - | - | 6 | (6) |
| 230401 | Deleted, report under 231301 | - | - | - | 47 | (47) |
| 231001 | Deleted, report under 231304 | - | - | - | 80 | (80) |
| 231302 | Creative Writing | - | - | - | 156 | (156) |
| 231303 | Professional, Technical, Business, and Scientific Writing | - | - | - | 103 | (103) |
| 240101 | Liberal Arts and Sciences/Liberal Studies | 56,463 | - | 56,463 | 80 | 56,383 |
| 240102 | General Studies | - | - | - | 80 | (80) |
| 240103 | Humanities/Humanistic Studies | - | - | - | 80 | (80) |
| 240199 | Liberal Arts and Sciences, General Studies and Humanities, Other | - | - | - | 80 | (80) |
| 250301 | Library and Archives Assisting | - | - | - | 133 | (133) |
| 259999 | Library Science, Other | - | - | - | 52 | (52) |
| 260101 | Biology/Biological Sciences, General | 35 | - | 35 | 26 | 10 |
| 260102 | Biomedical Sciences, General | 9 | - | 9 | - | 9 |
| 260202 | Biochemistry | - | - | - | 9 | (9) |
| 260203 | Biophysics | - | - | - | 9 | (9) |
| 260204 | Molecular Biology | - | - | - | 23 | (23) |
| 260208 | Photobiology | - | - | - | 14 | (14) |
| 260209 | Radiation Biology/Radiobiology | - | - | - | 23 | (23) |
| 260301 | Botany/Plant Biology | - | - | - | 23 | (23) |
| 260305 | Plant Pathology/Phytopathology | - | - | - | 23 | (23) |
| 260307 | Plant Physiology | - | - | - | 23 | (23) |
| 260308 | Plant Molecular Biology | - | - | - | 14 | (14) |
| 260399 | Botany/Plant Biology, Other | - | - | - | 23 | (23) |
| 260401 | Cell/Cellular Biology and Histology | - | - | - | 23 | (23) |
| 260403 | Anatomy | - | - | - | 23 | (23) |
| 260404 | Developmental Biology and Embryology | - | - | - | 14 | (14) |
| 260406 | Cell/Cellular and Molecular Biology | - | - | - | 14 | (14) |
| 260407 | Cell Biology and Anatomy | - | - | - | 14 | (14) |
| 260499 | Cell/Cellular Biology and Anatomical Sciences, Other | - | - | - | 35 | (35) |
| 260502 | Microbiology, General | - | - | - | 9 | (9) |
| 260503 | Medical Microbiology and Bacteriology | - | - | - | 23 | (23) |
| 260504 | Virology | - | - | - | 23 | (23) |
| 260505 | Parasitology | - | - | - | 23 | (23) |
| 260506 | Mycology | - | - | - | 14 | (14) |
| 260507 | Immunology | - | - | - | 23 | (23) |
| 260701 | Zoology/Animal Biology | - | - | - | 21 | (21) |
| 260702 | Entomology | - | - | - | 35 | (35) |
| 260707 | Animal Physiology | - | - | - | 35 | (35) |
| 260708 | Animal Behavior and Ethology | - | - | - | 12 | (12) |
| 260709 | Wildlife Biology | - | - | - | 12 | (12) |
| 260799 | Zoology/Animal Biology, Other | - | - | - | 21 | (21) |
| 260801 | Genetics, General | - | - | - | 14 | (14) |
| 260802 | Molecular Genetics | - | - | - | 14 | (14) |
| 260803 | Microbial and Eukaryotic Genetics | - | - | - | 14 | (14) |
| 260804 | Animal Genetics | - | - | - | 23 | (23) |
| 260805 | Plant Genetics | - | - | - | 23 | (23) |
| 260899 | Genetics, Other | - | - | - | 14 | (14) |
| 260910 | Pathology/Experimental Pathology | - | - | - | 23 | (23) |
| 261001 | Pharmacology | - | - | - | 23 | (23) |
| 261004 | Toxicology | - | - | - | 23 | (23) |
| 261101 | Biometry/Biometrics | - | - | - | 23 | (23) |
| 261102 | Biostatistics | - | - | - | 40 | (40) |
| 261201 | Biotechnology | 374 | - | 374 | 23 | 351 |
| 261301 | Ecology | - | - | - | 38 | (38) |
| 261302 | Marine Biology and Biological Oceanography | - | - | - | 23 | (23) |
| 261303 | Evolutionary Biology | - | - | - | 23 | (23) |
| 261304 | Aquatic Biology/Limnology | - | - | - | 14 | (14) |
| 261305 | Environmental Biology | - | - | - | 14 | (14) |
| 261306 | Population Biology | - | - | - | 14 | (14) |
| 261307 | Conservation Biology | - | - | - | 14 | (14) |
| 261308 | Systematic Biology/Biological Systematics | - | - | - | 14 | (14) |
| 261399 | Ecology, Evolution, Systematics and Population Biology, Other | - | - | - | 26 | (26) |
| 261501 | Neuroscience | - | - | - | 23 | (23) |
| 261502 | Neuroanatomy | - | - | - | 14 | (14) |
| 269999 | Biological and Biomedical Sciences, Other | - | - | - | 12 | (12) |
| 270101 | Mathematics, General | - | - | - | 26 | (26) |
| 270102 | Algebra and Number Theory | - | - | - | 9 | (9) |
| 270103 | Analysis and Functional Analysis | - | - | - | 9 | (9) |
| 270104 | Geometry/Geometric Analysis | - | - | - | 9 | (9) |
| 270105 | Topology and Foundations | - | - | - | 9 | (9) |
| 270301 | Applied Mathematics, General | - | - | - | 26 | (26) |
| 270303 | Computational Mathematics | - | - | - | 9 | (9) |
| 270399 | Applied Mathematics, Other | - | - | - | 9 | (9) |
| 270501 | Statistics, General | - | - | - | 26 | (26) |
| 270502 | Mathematical Statistics and Probability | - | - | - | 17 | (17) |
| 270599 | Statistics, Other | - | - | - | 17 | (17) |
| 279999 | Mathematics and Statistics, Other | - | - | - | 9 | (9) |
| 300101 | Biological and Physical Sciences | - | - | - | 9 | (9) |
| 300801 | Mathematics and Computer Science | - | - | - | 9 | (9) |
| 301001 | Biopsychology | - | - | - | 9 | (9) |
| 301101 | Gerontology | - | - | - | 12 | (12) |
| 301501 | Science, Technology and Society | - | - | - | 9 | (9) |
| 301601 | Accounting and Computer Science | - | - | - | 1,011 | (1,011) |
| 301701 | Behavioral Sciences | - | - | - | 134 | (134) |
| 301801 | Natural Sciences | - | - | - | 16 | (16) |
| 301901 | Nutrition Sciences | - | - | - | 60 | (60) |
| 303301 |  | 1 |  | 1 |  | 1 |
| 310101 | Parks, Recreation and Leisure Studies | 10 | - | 10 | 182 | (173) |
| 310301 | Parks, Recreation and Leisure Facilities Management, General | - | - | - | 177 | (177) |
| 310302 |  | 6 |  | 6 |  | 6 |
| 310501 | Health and Physical Education/Fitness, General | - | - | - | 5 | (5) |
| 310504 | Sport and Fitness Administration/Management | - | - | - | 182 | (182) |
| 310507 |  | 4 |  | 4 |  | 4 |
| 310599 | Health and Physical Education/Fitness, Other | - | - | - | 177 | (177) |
| 319999 | Parks, Recreation, Leisure, and Fitness Studies, Other | - | - | - | 177 | (177) |
| 380102 | Logic | - | - | - | 9 | (9) |
| 390201 | Bible/Biblical Studies | - | - | - | 146 | (146) |
| 390301 | Missions/Missionary Studies and Missiology | - | - | - | 146 | (146) |
| 390401 | Religious Education | - | - | - | 146 | (146) |
| 390501 | Religious/Sacred Music | - | - | - | 43 | (43) |
| 390601 | Theology/Theological Studies | - | - | - | 103 | (103) |
| 390602 | Divinity/Ministry | - | - | - | 103 | (103) |
| 390604 | Pre-Theology/Pre-Ministerial Studies | - | - | - | 103 | (103) |
| 390605 | Rabbinical Studies | - | - | - | 103 | (103) |
| 390699 | Theological and Ministerial Studies, Other | - | - | - | 149 | (149) |
| 390701 | Pastoral Studies/Counseling | - | - | - | 149 | (149) |
| 390702 | Youth Ministry | - | - | - | 249 | (249) |
| 390799 | Pastoral Counseling and Specialized Ministries, Other | - | - | - | 103 | (103) |
| 399999 | Theology and Religious Vocations, Other | - | - | - | 103 | (103) |
| 400101 | Physical Sciences | - | - | - | 9 | (9) |
| 400201 | Astronomy | - | - | - | 9 | (9) |
| 400202 | Astrophysics | - | - | - | 9 | (9) |
| 400203 | Planetary Astronomy and Science | - | - | - | 9 | (9) |
| 400401 | Atmospheric Sciences and Meteorology, General | - | - | - | 14 | (14) |
| 400402 | Atmospheric Chemistry and Climatology | - | - | - | 14 | (14) |
| 400403 | Atmospheric Physics and Dynamics | - | - | - | 14 | (14) |
| 400404 | Meteorology | - | - | - | 14 | (14) |
| 400499 | Atmospheric Sciences and Meteorology, Other | - | - | - | 14 | (14) |
| 400501 | Chemistry, General | - | - | - | 32 | (32) |
| 400502 | Analytical Chemistry | - | - | - | 32 | (32) |
| 400503 | Inorganic Chemistry | - | - | - | 32 | (32) |
| 400504 | Organic Chemistry | - | - | - | 32 | (32) |
| 400506 | Physical Chemistry | - | - | - | 32 | (32) |
| 400507 | Polymer Chemistry | - | - | - | 32 | (32) |
| 400508 | Chemical Physics | - | - | - | 32 | (32) |
| 400599 | Chemistry, Other | - | - | - | 32 | (32) |
| 400601 | Geology/Earth Science, General | - | - | - | 22 | (22) |
| 400602 | Geochemistry | - | - | - | 17 | (17) |
| 400603 | Geophysics and Seismology | - | - | - | 17 | (17) |
| 400604 | Paleontology | - | - | - | 17 | (17) |
| 400605 | Hydrology and Water Resources Science | - | - | - | 14 | (14) |
| 400606 | Geochemistry and Petrology | - | - | - | 17 | (17) |
| 400607 | Oceanography, Chemical and Physical | - | - | - | 22 | (22) |
| 400699 | Geological and Earth Sciences/Geosciences, Other | - | - | - | 17 | (17) |
| 400801 | Physics, General | - | - | - | 9 | (9) |
| 400802 | Atomic/Molecular Physics | - | - | - | 9 | (9) |
| 400804 | Elementary Particle Physics | - | - | - | 9 | (9) |
| 400805 | Plasma and High-Temperature Physics | - | - | - | 9 | (9) |
| 400806 | Nuclear Physics | - | - | - | 9 | (9) |
| 400807 | Optics/Optical Sciences | - | - | - | 9 | (9) |
| 400808 | Condensed Matter and Materials Physics | - | - | - | 9 | (9) |
| 400809 | Acoustics | - | - | - | 9 | (9) |
| 400810 | Theoretical and Mathematical Physics | - | - | - | 9 | (9) |
| 400899 | Physics, Other | - | - | - | 9 | (9) |
| 401001 | Materials Science | - | - | - | 86 | (86) |
| 409999 | Physical Sciences, Other | - | - | - | 13 | (13) |
| 410101 | Biology Technician/Biotechnology Laboratory Technician | 34 | - | 34 | 20 | 13 |
| 410204 | Industrial Radiologic Technology/Technician | - | - | - | 3 | (3) |
| 410205 | Nuclear/Nuclear Power Technology/Technician | - | - | - | 3 | (3) |
| 410299 | Nuclear and Industrial Radiologic Technologies/Technicians, Other | - | - | - | 3 | (3) |
| 410301 | Chemical Technology/Technician | 74 | - | 74 | 29 | 45 |
| 410399 | Physical Science Technologies/Technicians, Other | - | - | - | 75 | (75) |
| 419999 | Science Technologies/Technicians, Other | - | - | - | 75 | (75) |
| 430102 | Corrections | 717 | 863 | (146) | 378 | 339 |
| 430103 | Criminal Justice/Law Enforcement Administration | 784 | - | 784 | 55 | 729 |
| 430104 | Criminal Justice/Safety Studies | 7 | - | 7 | 55 | (48) |
| 430106 | Forensic Science and Technology | 200 | - | 200 | 32 | 167 |
| 430107 | Criminal Justice/Police Science | 2,231 | - | 2,231 | 577 | 1,655 |
| 430109 | Security and Loss Prevention Services | 208 | - | 208 | 730 | (522) |
| 430110 | Juvenile Corrections | - | - | - | 313 | (313) |
| 430111 | Criminalistics and Criminal Science | - | - | - | 527 | (527) |
| 430112 | Securities Services Administration/Management | - | - | - | 927 | (927) |
| 430113 | Corrections Administration | - | - | - | 32 | (32) |
| 430116 |  | 2 |  | 2 |  | 2 |
| 430199 | Corrections and Criminal Justice, Other | 117 | - | 117 | 313 | (196) |
| 430201 | Fire Prevention and Safety Technology/Technician | 172 | - | 172 | 55 | 117 |
| 430202 | Fire Services Administration | 48 | - | 48 | 45 | 3 |
| 430203 | Fire Science/Fire-fighting | 688 | 189 | 499 | 270 | 418 |
| 430299 | Fire Protection, Other | - | - | - | 261 | (261) |
| 430302 | Crisis/Emergency/Disaster Management | 39 | - | 39 | - | 39 |
| 430399 |  | 25 |  | 25 |  | 25 |
| 439999 | Homeland Security, Law Enforcement, Firefighting and Related Protective Services, Other | 291 | - | 291 | 208 | 82 |
| 440000 | Human Services, General | - | - | - | 40 | (40) |
| 440201 | Community Organization and Advocacy | - | - | - | 40 | (40) |
| 440401 | Public Administration | 78 | 14,062 | (13,983) | 1,299 | (1,221) |
| 440501 | Public Policy Analysis, General | - | - | - | 159 | (159) |
| 440701 | Social Work | - | - | - | 51 | (51) |
| 449999 | Public Administration and Social Service Professions, Other | - | - | - | 447 | (447) |
| 450101 | Social Sciences, General | - | - | - | 12 | (12) |
| 450401 | Criminology | - | - | - | 1 | (1) |
| 450501 | Demography and Population Studies | - | - | - | 1 | (1) |
| 450601 | Economics, General | - | - | - | 4 | (4) |
| 450602 | Applied Economics | - | - | - | 4 | (4) |
| 450603 | Econometrics and Quantitative Economics | - | - | - | 3 | (3) |
| 450604 | Development Economics and International Development | - | - | - | 3 | (3) |
| 450605 | International Economics | - | - | - | 3 | (3) |
| 450699 | Economics, Other | - | - | - | 3 | (3) |
| 450702 | Geographic Information Science and Cartography | 0 | - | 0 | 61 | (61) |
| 451101 | Sociology | - | - | - | 1 | (1) |
| 451201 | Urban Studies/Affairs | - | - | - | 1 | (1) |
| 459999 | Social Sciences, Other | - | - | - | 12 | (12) |
| 460101 | Mason/Masonry | 0 | 143 | (143) | 624 | (624) |
| 460201 | Carpentry/Carpenter | 13 | - | 13 | 1,173 | (1,160) |
| 460301 | Electrical and Power Transmission Installation/Installer, General | 3 | - | 3 | 588 | (585) |
| 460302 | Electrician | 132 | - | 132 | 958 | (826) |
| 460303 | Lineworker | 7 | - | 7 | 588 | (581) |
| 460399 | Electrical and Power Transmission Installers, Other | - | - | - | 588 | (588) |
| 460401 | Building/Property Maintenance | - | - | - | 487 | (487) |
| 460402 | Concrete Finishing/Concrete Finisher | - | - | - | 677 | (677) |
| 460403 | Building/Home/Construction Inspection/Inspector | - | - | - | 558 | (558) |
| 460404 | Drywall Installation/Drywaller | - | - | - | 559 | (559) |
| 460406 | Glazier | - | - | - | 547 | (547) |
| 460408 | Painting/Painter and Wall Coverer | - | - | - | 834 | (834) |
| 460410 | Roofer | - | - | - | 748 | (748) |
| 460411 | Metal Building Assembly/Assembler | - | - | - | 52 | (52) |
| 460412 | Building/Construction Site Management/Manager | 11 | - | 11 | 490 | (479) |
| 460499 | Building/Construction Finishing, Management, and Inspection, Other | - | - | - | 491 | (491) |
| 460502 | Pipefitting/Pipefitter and Sprinkler Fitter | 28 | - | 28 | 225 | (198) |
| 460503 | Plumbing Technology/Plumber | 38 | 4,418 | (4,380) | 761 | (723) |
| 460504 | Well Drilling/Driller | - | - | - | 499 | (499) |
| 460505 | Blasting/Blaster | - | - | - | 487 | (487) |
| 460599 | Plumbing and Related Water Supply Services, Other | - | - | - | 225 | (225) |
| 469999 | Construction Trades, Other | - | - | - | 613 | (613) |
| 470101 | Electrical/Electronics Equipment Installation and Repair, General | - | - | - | 6 | (6) |
| 470102 | Business Machine Repair | - | - | - | 57 | (57) |
| 470103 | Communications Systems Installation and Repair Technology | 26 | 1,839 | (1,813) | 211 | (186) |
| 470104 | Computer Installation and Repair Technology/Technician | 177 | - | 177 | 96 | 81 |
| 470105 | Industrial Electronics Technology/Technician | - | - | - | 79 | (79) |
| 470106 | Appliance Installation and Repair Technology/Technician | - | - | - | 44 | (44) |
| 470110 | Security System Installation, Repair, and Inspection Technology/Technician | - | - | - | 61 | (61) |
| 470199 | Electrical/Electronics Maintenance and Repair Technology, Other | 1 | - | 1 | - | 1 |
| 470201 | Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician | 281 | - | 281 | 378 | (97) |
| 470302 | Heavy Equipment Maintenance Technology/Technician | - | - | - | 73 | (73) |
| 470303 | Industrial Mechanics and Maintenance Technology | - | - | - | 216 | (216) |
| 470399 | Heavy/Industrial Equipment Maintenance Technologies, Other | - | - | - | 192 | (192) |
| 470403 | Locksmithing and Safe Repair | - | - | - | 34 | (34) |
| 470408 | Watchmaking and Jewelrymaking | - | - | - | 13 | (13) |
| 470603 | Autobody/Collision and Repair Technology/Technician | 70 | - | 70 | 79 | (9) |
| 470604 | Automobile/Automotive Mechanics Technology/Technician | 240 | - | 240 | 514 | (274) |
| 470605 | Diesel Mechanics Technology/Technician | 27 | - | 27 | 98 | (71) |
| 470606 | Small Engine Mechanics and Repair Technology/Technician | - | - | - | 57 | (57) |
| 470607 | Airframe Mechanics and Aircraft Maintenance Technology/Technician | 93 | - | 93 | 132 | (39) |
| 470608 | Aircraft Powerplant Technology/Technician | 90 | - | 90 | 118 | (28) |
| 470609 | Avionics Maintenance Technology/Technician | 21 | - | 21 | 29 | (9) |
| 470611 | Motorcycle Maintenance and Repair Technology/Technician | - | - | - | 14 | (14) |
| 470612 | Vehicle Emissions Inspection and Maintenance Technology/Technician | - | - | - | 506 | (506) |
| 470613 | Medium/Heavy Vehicle and Truck Technology/Technician | 29 | 1,921 | (1,891) | 604 | (575) |
| 470614 | Alternative Fuel Vehicle Technology/Technician | - | - | - | 506 | (506) |
| 470615 | Engine Machinist | - | - | - | 2 | (2) |
| 470616 | Marine Maintenance/Fitter and Ship Repair Technology/Technician | 6 | - | 6 | 40 | (34) |
| 470699 | Vehicle Maintenance and Repair Technologies, Other | - | - | - | 14 | (14) |
| 479999 | Mechanic and Repair Technologies/Technicians, Other | - | - | - | 9 | (9) |
| 480303 | Upholstery/Upholsterer | - | - | - | 17 | (17) |
| 480501 | Machine Tool Technology/Machinist | - | - | - | 89 | (89) |
| 480503 | Machine Shop Technology/Assistant | 22 | - | 22 | 160 | (138) |
| 480506 | Sheet Metal Technology/Sheetworking | 4 | - | 4 | 93 | (89) |
| 480507 | Tool and Die Technology/Technician | - | - | - | 3 | (3) |
| 480508 | Welding Technology/Welder | 86 | 163 | (77) | 139 | (53) |
| 480510 |  | 18 |  | 18 |  | 18 |
| 480703 | Cabinetmaking and Millwork | - | - | - | 18 | (18) |
| 480801 | Boilermaking/Boilermaker | - | - | - | 4 | (4) |
| 490101 | Aeronautics/Aviation/Aerospace Science and Technology, General | - | - | - | 32 | (32) |
| 490102 | Airline/Commercial/Professional Pilot and Flight Crew | 72 | 940 | (867) | 88 | (15) |
| 490104 | Aviation/Airway Management and Operations | 295 | - | 295 | 32 | 263 |
| 490105 | Air Traffic Controller | - | - | - | 32 | (32) |
| 490108 | Flight Instructor | - | - | - | 88 | (88) |
| 490202 | Construction/Heavy Equipment/Earthmoving Equipment Operation | - | - | - | 261 | (261) |
| 490205 | Truck and Bus Driver/Commercial Vehicle Operator and Instructor | 224 | 8,990 | (8,766) | 1,183 | (960) |
| 490206 | Mobil Crane Operation/Operator | - | - | - | 224 | (224) |
| 490299 | Ground Transportation, Other | - | - | - | 165 | (165) |
| 490303 | Commercial Fishing | - | - | - | 23 | (23) |
| 490304 | Diver, Professional and Instructor | 16 | - | 16 | 5 | 11 |
| 490309 | Marine Science/Merchant Marine Officer | - | - | - | 23 | (23) |
| 490399 | Marine Transportation, Other | - | - | - | 42 | (42) |
| 500101 | Visual and Performing Arts, General | - | - | - | 68 | (68) |
| 500102 | Digital Arts | 94 | - | 94 | - | 94 |
| 500201 | Crafts/Craft Design, Folk Art and Artisanry | - | - | - | 3 | (3) |
| 500301 | Dance, General | - | - | - | 1 | (1) |
| 500399 | Dance, Other | - | - | - | 1 | (1) |
| 500401 | Design and Visual Communications, General | - | - | - | 178 | (178) |
| 500402 | Commercial and Advertising Art | 224 | 179 | 46 | 171 | 53 |
| 500404 | Industrial and Product Design | - | - | - | 172 | (172) |
| 500406 | Commercial Photography | 3 | - | 3 | 51 | (48) |
| 500407 | Fashion/Apparel Design | - | - | - | 3 | (3) |
| 500408 | Interior Design | 95 | - | 95 | 64 | 31 |
| 500409 | Graphic Design | - | - | - | 203 | (203) |
| 500410 | Illustration | - | - | - | 13 | (13) |
| 500499 | Design and Applied Arts, Other | - | - | - | 19 | (19) |
| 500501 | Drama and Dramatics/Theatre Arts, General | - | - | - | 88 | (88) |
| 500502 | Technical Theatre/Theatre Design and Technology | 73 | - | 73 | 5 | 68 |
| 500504 | Playwriting and Screenwriting | - | - | - | 47 | (47) |
| 500506 | Acting | - | - | - | 25 | (25) |
| 500507 | Directing and Theatrical Production | - | - | - | 88 | (88) |
| 500599 | Dramatic/Theatre Arts and Stagecraft, Other | - | - | - | 88 | (88) |
| 500601 | Film/Cinema/Video Studies | - | - | - | 63 | (63) |
| 500602 | Cinematography and Film/Video Production | 311 | 102 | 209 | 74 | 238 |
| 500605 | Photography | 23 | - | 23 | 51 | (29) |
| 500699 | Film/Video and Photographic Arts, Other | - | - | - | 51 | (51) |
| 500701 | Art/Art Studies, General | - | - | - | 65 | (65) |
| 500702 | Fine/Studio Arts, General | - | - | - | 17 | (17) |
| 500705 | Drawing | - | - | - | 38 | (38) |
| 500706 | Intermedia/Multimedia | - | - | - | 54 | (54) |
| 500708 | Painting | - | - | - | 38 | (38) |
| 500709 | Sculpture | - | - | - | 13 | (13) |
| 500710 | Printmaking | - | - | - | 38 | (38) |
| 500711 | Ceramic Arts and Ceramics | - | - | - | 13 | (13) |
| 500799 | Fine Arts and Art Studies, Other | - | - | - | 17 | (17) |
| 500903 | Music Performance, General | - | - | - | 43 | (43) |
| 500904 | Music Theory and Composition | - | - | - | 43 | (43) |
| 500905 | Musicology and Ethnomusicology | - | - | - | 43 | (43) |
| 500906 | Conducting | - | - | - | 43 | (43) |
| 500908 | Voice and Opera | - | - | - | 43 | (43) |
| 500913 | Music Technology | 71 | - | 71 | - | 71 |
| 500999 | Music, Other | 49 | - | 49 | 43 | 6 |
| 501002 | Fine and Studio Arts Management | - | - | - | 301 | (301) |
| 501003 | Music Management | - | - | - | 43 | (43) |
| 501004 | Theatre/Theatre Arts Management | - | - | - | 350 | (350) |
| 509999 | Visual and Performing Arts, Other | 31 | - | 31 | - | 31 |
| 510000 | Health Services/Allied Health/Health Sciences, General | 13 | - | 13 | - | 13 |
| 510601 | Dental Assisting/Assistant | 217 | - | 217 | 183 | 34 |
| 510602 | Dental Hygiene/Hygienist | 360 | - | 360 | 156 | 205 |
| 510603 | Dental Laboratory Technology/Technician | 11 | - | 11 | 30 | (19) |
| 510701 | Health/Health Care Administration/Management | 117 | - | 117 | 153 | (37) |
| 510702 | Hospital and Health Care Facilities Administration/Management | 4 | - | 4 | 153 | (149) |
| 510703 | Health Unit Coordinator/Ward Clerk | 9 | - | 9 | - | 9 |
| 510704 | Health Unit Manager/Ward Supervisor | - | - | - | 153 | (153) |
| 510705 | Medical Office Management/Administration | - | - | - | 559 | (559) |
| 510706 | Health Information/Medical Records Administration/Administrator | - | - | - | 153 | (153) |
| 510707 | Health Information/Medical Records Technology/Technician | 690 | - | 690 | 119 | 571 |
| 510708 | Medical Transcription/Transcriptionist | - | - | - | 42 | (42) |
| 510710 | Medical Office Assistant/Specialist | - | - | - | 784 | (784) |
| 510711 | Medical/Health Management and Clinical Assistant/Specialist | - | - | - | 979 | (979) |
| 510712 | Medical Reception/Receptionist | - | - | - | 559 | (559) |
| 510713 | Medical Insurance Coding Specialist/Coder | - | - | - | 678 | (678) |
| 510714 | Medical Insurance Specialist/Medical Biller | - | - | - | 225 | (225) |
| 510715 | Health/Medical Claims Examiner | - | - | - | 191 | (191) |
| 510716 | Medical Administrative/Executive Assistant and Medical Secretary | 69 | - | 69 | 972 | (903) |
| 510717 | Medical Staff Services Technology/Technician | - | - | - | 153 | (153) |
| 510799 | Health and Medical Administrative Services, Other | 3 | - | 3 | 153 | (150) |
| 510801 | Medical/Clinical Assistant | 144 | 965 | (821) | 608 | (464) |
| 510802 | Clinical/Medical Laboratory Assistant | 2 | - | 2 | 97 | (95) |
| 510803 | Occupational Therapist Assistant | 81 | 31 | 51 | 27 | 54 |
| 510805 | Pharmacy Technician/Assistant | 83 | - | 83 | 229 | (146) |
| 510806 | Physical Therapy Technician/Assistant | 302 | 592 | (290) | 108 | 194 |
| 510808 | Veterinary/Animal Health Technology/Technician and Veterinary Assistant | 151 | - | 151 | 106 | 44 |
| 510809 | Anesthesiologist Assistant | - | - | - | 559 | (559) |
| 510810 | Emergency Care Attendant (EMT Ambulance) | - | - | - | 131 | (131) |
| 510811 | Pathology/Pathologist Assistant | - | - | - | 67 | (67) |
| 510812 | Respiratory Therapy Technician/Assistant | - | - | - | 6 | (6) |
| 510813 | Chiropractic Assistant/Technician | - | - | - | 559 | (559) |
| 510899 | Allied Health and Medical Assisting Services, Other | - | - | - | 687 | (687) |
| 510901 | Cardiovascular Technology/Technologist | 66 | - | 66 | 52 | 14 |
| 510902 | Electrocardiograph Technology/Technician | 9 | - | 9 | 52 | (43) |
| 510903 | Electroneurodiagnostic/Electroencephalographic Technology/Technologist | - | - | - | 63 | (63) |
| 510904 | Emergency Medical Technology/Technician (EMT Paramedic) | 3,940 | - | 3,940 | 131 | 3,809 |
| 510905 | Nuclear Medical Technology/Technologist | 54 | - | 54 | 17 | 37 |
| 510906 | Perfusion Technology/Perfusionist | - | - | - | 52 | (52) |
| 510907 | Medical Radiologic Technology/Science - Radiation Therapist | 533 | - | 533 | 147 | 386 |
| 510908 | Respiratory Care Therapy/Therapist | 322 | - | 322 | 69 | 253 |
| 510909 | Surgical Technology/Technologist | 146 | - | 146 | 67 | 78 |
| 510910 | Diagnostic Medical Sonography/Sonographer and Ultrasound Technician | 112 | - | 112 | 79 | 33 |
| 510911 | Radiologic Technology/Science - Radiographer | - | - | - | 130 | (130) |
| 510912 | Physician Assistant | 37 | - | 37 | 88 | (52) |
| 510913 | Athletic Training/Trainer | - | - | - | 12 | (12) |
| 510914 | Gene/Genetic Therapy | - | - | - | 63 | (63) |
| 510915 | Cardiopulmonary Technology/Technologist | - | - | - | 52 | (52) |
| 510916 | Radiation Protection/Health Physics Technician | - | - | - | 23 | (23) |
| 510999 | Allied Health Diagnostic, Intervention, and Treatment Professions, Other | 1 | - | 1 | 287 | (286) |
| 511001 | Blood Bank Technology Specialist | 155 | - | 155 | 97 | 58 |
| 511002 | Cytotechnology/Cytotechnologist | - | - | - | 110 | (110) |
| 511003 | Hematology Technology/Technician | - | - | - | 97 | (97) |
| 511004 | Clinical/Medical Laboratory Technician | 99 | - | 99 | 97 | 3 |
| 511005 | Clinical Laboratory Science/Medical Technology/Technologist | 7 | - | 7 | 110 | (103) |
| 511006 | Ophthalmic Laboratory Technology/Technician | 43 | - | 43 | 40 | 2 |
| 511007 | Histologic Technology/Histotechnologist | - | - | - | 110 | (110) |
| 511008 | Histologic Technician | 22 | - | 22 | 97 | (74) |
| 511009 | Phlebotomy Technician/Phlebotomist | 177 | - | 177 | - | 177 |
| 511010 | Cytogenetics/Genetics/Clinical Genetics Technology/Technologist | - | - | - | 110 | (110) |
| 511011 | Renal/Dialysis Technologist/Technician | - | - | - | 110 | (110) |
| 511099 | Clinical/Medical Laboratory Science and Allied Professions, Other | 21 | - | 21 | 110 | (89) |
| 511501 | Substance Abuse/Addiction Counseling | 14 | - | 14 | 61 | (47) |
| 511502 | Psychiatric/Mental Health Services Technician | 91 | - | 91 | 67 | 24 |
| 511503 | Clinical/Medical Social Work | 0 | - | 0 | 61 | (61) |
| 511504 | Community Health Services/Liaison/Counseling | 137 | - | 137 | 37 | 101 |
| 511506 | Clinical Pastoral Counseling/Patient Counseling | - | - | - | 103 | (103) |
| 511599 | Mental and Social Health Services and Allied Professions, Other | - | - | - | 309 | (309) |
| 511801 | Opticianry/Ophthalmic Dispensing Optician | 99 | - | 99 | 75 | 24 |
| 511802 | Optometric Technician/Assistant | 1 | - | 1 | 559 | (558) |
| 511803 | Ophthalmic Technician/Technologist | 13 | - | 13 | 559 | (546) |
| 511804 | Orthoptics/Orthoptist | - | - | - | 559 | (559) |
| 512201 | Public Health, General | - | - | - | 153 | (153) |
| 512202 | Environmental Health | - | - | - | 22 | (22) |
| 512206 | Occupational Health and Industrial Hygiene | - | - | - | 22 | (22) |
| 512207 | Public Health Education and Promotion | - | - | - | 37 | (37) |
| 512208 | Community Health and Preventive Medicine | - | - | - | 153 | (153) |
| 512209 | Maternal and Child Health | - | - | - | 37 | (37) |
| 512210 | International Public Health/International Health | - | - | - | 37 | (37) |
| 512211 | Health Services Administration | 108 | - | 108 | 153 | (46) |
| 512307 | Orthotist/Prosthetist | 18 | - | 18 | 10 | 8 |
| 512309 | Therapeutic Recreation/Recreational Therapy | - | - | - | 4 | (4) |
| 512310 | Vocational Rehabilitation Counseling/Counselor | - | - | - | 31 | (31) |
| 512312 | Assistive/Augmentative Technology and Rehabilitation Engineering | - | - | - | 79 | (79) |
| 512601 | Health Aide | - | - | - | 21 | (21) |
| 512602 | Home Health Aide/Home Attendant | 29 | - | 29 | 464 | (435) |
| 512603 | Medication Aide | - | - | - | 27 | (27) |
| 512699 | Health Aides/Attendants/Orderlies, Other | - | - | - | 27 | (27) |
| 512703 | Medical Illustration/Medical Illustrator | - | - | - | 13 | (13) |
| 513101 | Dietetics/Dietitian | - | - | - | 34 | (34) |
| 513102 | Clinical Nutrition/Nutritionist | - | - | - | 27 | (27) |
| 513103 | Dietetic Technician | 10 | - | 10 | 7 | 3 |
| 513104 | Dietitian Assistant | 6 | - | 6 | 7 | (1) |
| 513199 | Dietetics and Clinical Nutrition Services, Other | - | - | - | 27 | (27) |
| 513501 | Massage Therapy/Therapeutic Massage | 123 | - | 123 | 116 | 7 |
| 513502 | Asian Bodywork Therapy | - | - | - | 116 | (116) |
| 513503 | Somatic Bodywork | - | - | - | 116 | (116) |
| 513599 | Somatic Bodywork and Related Therapeutic Services, Other | - | - | - | 116 | (116) |
| 513602 | Yoga Teacher Training/Yoga Therapy | - | - | - | 27 | (27) |
| 513701 | Aromatherapy | - | - | - | 27 | (27) |
| 513702 | Herbalism/Herbalist | - | - | - | 27 | (27) |
| 513703 | Polarity Therapy | - | - | - | 27 | (27) |
| 513704 | Reiki | - | - | - | 27 | (27) |
| 513799 | Energy and Biologically Based Therapies, Other | - | - | - | 27 | (27) |
| 513801 | Registered Nursing/Registered Nurse | 5,364 | - | 5,364 | - | 5,364 |
| 513802 | Nursing Administration | - | - | - | 153 | (153) |
| 513901 | Licensed Practical/Vocational Nurse Training | 626 | - | 626 | 624 | 2 |
| 513902 | Nursing Assistant/Aide and Patient Care Assistant/Aide | 628 | - | 628 | - | 628 |
| 519999 | Health Professions and Related Clinical Sciences, Other | - | - | - | 79 | (79) |
| 520101 | Business/Commerce, General | - | - | - | 2,720 | (2,720) |
| 520201 | Business Administration and Management, General | 3,037 | 13,735 | (10,698) | 2,720 | 317 |
| 520202 | Purchasing, Procurement/Acquisitions and Contracts Management | 162 | - | 162 | 154 | 8 |
| 520203 | Logistics, Materials, and Supply Chain Management | 14 | - | 14 | 142 | (128) |
| 520204 | Office Management and Supervision | 762 | - | 762 | 902 | (140) |
| 520205 | Operations Management and Supervision | 145 | - | 145 | 1,053 | (909) |
| 520206 | Non-Profit/Public/Organizational Management | - | - | - | 328 | (328) |
| 520207 | Customer Service Management | 5 | - | 5 | 902 | (897) |
| 520208 | E-Commerce/Electronic Commerce | - | - | - | 946 | (946) |
| 520209 | Transportation/Mobility Management | 149 | - | 149 | - | 149 |
| 520299 | Business Administration, Management and Operations, Other | 1,769 | - | 1,769 | 288 | 1,481 |
| 520301 | Accounting | - | - | - | 1,191 | (1,191) |
| 520302 | Accounting Technology/Technician and Bookkeeping | 1,311 | 13,490 | (12,179) | 740 | 571 |
| 520303 | Auditing | - | - | - | 1,011 | (1,011) |
| 520304 | Accounting and Finance | - | - | - | 1,270 | (1,270) |
| 520305 | Accounting and Business/Management | - | - | - | 1,270 | (1,270) |
| 520399 | Accounting and Related Services, Other | 84 | - | 84 | 688 | (604) |
| 520401 | Administrative Assistant and Secretarial Science, General | 5 | - | 5 | 1,730 | (1,725) |
| 520402 | Executive Assistant/Executive Secretary | 424 | - | 424 | 1,730 | (1,305) |
| 520406 | Receptionist | - | - | - | 2,546 | (2,546) |
| 520407 | Business/Office Automation/Technology/Data Entry | 193 | - | 193 | - | 193 |
| 520408 | General Office Occupations and Clerical Services | - | - | - | 445 | (445) |
| 520410 | Traffic, Customs, and Transportation Clerk/Technician | - | - | - | 296 | (296) |
| 520411 | Customer Service Support/Call Center/Teleservice Operation | 6 | - | 6 | 2,546 | (2,540) |
| 520501 | Business/Corporate Communications | - | - | - | 150 | (150) |
| 520601 | Business/Managerial Economics | - | - | - | 4 | (4) |
| 520701 | Entrepreneurship/Entrepreneurial Studies | 715 | 13,735 | (13,019) | 1,218 | (503) |
| 520702 | Franchising and Franchise Operations | - | - | - | 335 | (335) |
| 520703 | Small Business Administration/Management | 198 | - | 198 | 288 | (90) |
| 520799 | Entrepreneurial and Small Business Operations, Other | - | - | - | 288 | (288) |
| 520801 | Finance, General | 13 | 5,700 | (5,687) | 755 | (742) |
| 520803 | Banking and Financial Support Services | 19 | 189 | (170) | 606 | (587) |
| 520804 | Financial Planning and Services | - | - | - | 361 | (361) |
| 520806 | International Finance | - | - | - | 203 | (203) |
| 520807 | Investments and Securities | - | - | - | 210 | (210) |
| 520808 | Public Finance | - | - | - | 203 | (203) |
| 520809 | Credit Management | - | - | - | 370 | (370) |
| 520899 | Finance and Financial Management Services, Other | - | - | - | 194 | (194) |
| 520901 | Hospitality Administration/Management, General | 162 | - | 162 | 123 | 38 |
| 520903 | Tourism and Travel Services Management | 5 | - | 5 | 288 | (283) |
| 520904 | Hotel/Motel Administration/Management | 263 | - | 263 | 123 | 140 |
| 520905 | Restaurant/Food Services Management | 149 | - | 149 | 92 | 57 |
| 520906 | Resort Management | - | - | - | 32 | (32) |
| 520909 | Dental Assisting/Assistant | 30 | - | 30 | - | 30 |
| 520999 | Hospitality Administration/Management, Other | - | - | - | 288 | (288) |
| 521001 | Human Resources Management/Personnel Administration, General | - | - | - | 273 | (273) |
| 521002 | Labor and Industrial Relations | - | - | - | 273 | (273) |
| 521003 | Organizational Behavior Studies | - | - | - | 47 | (47) |
| 521101 | International Business/Trade/Commerce | 30 | 13,735 | (13,705) | 890 | (860) |
| 521201 | Management Information Systems, General | 99 | - | 99 | 82 | 17 |
| 521206 | Information Resources Management | - | - | - | 82 | (82) |
| 521207 | Knowledge Management | - | - | - | 82 | (82) |
| 521299 | Management Information Systems and Services, Other | 42 | - | 42 | - | 42 |
| 521301 | Management Science | - | - | - | 47 | (47) |
| 521302 | Business Statistics | - | - | - | 65 | (65) |
| 521304 | Actuarial Science | - | - | - | 55 | (55) |
| 521401 | Marketing/Marketing Management, General | 172 | 4,035 | (3,863) | 265 | (93) |
| 521402 | Marketing Research | - | - | - | 119 | (119) |
| 521403 | International Marketing | - | - | - | 117 | (117) |
| 521499 | Marketing, Other | - | - | - | 206 | (206) |
| 521501 | Real Estate | 123 | 7,044 | (6,921) | 786 | (663) |
| 521601 | Taxation | - | - | - | 1,119 | (1,119) |
| 521701 | Insurance | - | - | - | 698 | (698) |
| 521801 | Sales, Distribution, and Marketing Operations, General | - | - | - | 962 | (962) |
| 521802 | Merchandising and Buying Operations | - | - | - | 47 | (47) |
| 521803 | Retailing and Retail Operations | - | - | - | 1,001 | (1,001) |
| 521804 | Selling Skills and Sales Operations | - | - | - | 1,457 | (1,457) |
| 521899 | General Merchandising, Sales, and Related Marketing Operations, Other | 0 | - | 0 | 999 | (998) |
| 521901 | Auctioneering | - | - | - | 55 | (55) |
| 521902 | Fashion Merchandising | - | - | - | 856 | (856) |
| 521904 | Apparel and Accessories Marketing Operations | - | - | - | 856 | (856) |
| 521905 | Tourism and Travel Services Marketing Operations | - | - | - | 33 | (33) |
| 521907 | Vehicle and Vehicle Parts and Accessories Marketing Operations | - | - | - | 147 | (147) |
| 521908 | Business and Personal/Financial Services Marketing Operations | 696 | - | 696 | 163 | 533 |
| 521909 | Special Products Marketing Operations | - | - | - | 1,945 | (1,945) |
| 521910 | Hospitality and Recreation Marketing Operations | - | - | - | 32 | (32) |
| 521999 | Specialized Merchandising, Sales, and Marketing Operations, Other | - | - | - | 1,945 | (1,945) |
| 529999 | Business, Management, Marketing, and Related Support Services, Other | 1 | 18,510 | (18,510) | 2,981 | (2,981) |
| 999999 | No related CIP | - | - | - | 1,492 | (1,492) |
|  |  | **102,311** | **164,684** | **(62,373)** | **164,684** | **(62,373)** |

# Appendix 2. FSU-CEFA GAP Methodology

The employment data was derived from the NETS Database[[44]](#footnote-44) per Florida County (using available FIPS codes)[[45]](#footnote-45) and 6-digit NAICS[[46]](#footnote-46) codes, for the years 1990 through 2013 (the latest year available data to date). Data per County is combined per the twenty-eight Florida Community and State Colleges regions as shown in Figure 8.

**Figure 8. Map of the Florida Community and State Colleges Regions**

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From the NETS employment data, it can be deduced not only which sector is responsible for most employment in each region, but also in which sectors job growth is seen (or for that matter a shift in employment between sectors). One drawback is that the database is gradually built over the last twenty-four years, with increasing establishments or businesses. The CEFA staff used an index method across the years (time-series) of NAICS codes, using external employment information. For the analyses, twenty-four years of indexing is used to extrapolate 2-digit NAICS level indexes for both the years 2015 and 2023, as a means to match the employment projection years of the Department of Economic Opportunity Regional Employment Projections. Hence, the indexing from the NETS is combined with the projections of the Department of Economic Opportunity.

The Department of Economic Opportunity data is provided per Standard Occupational Classification (SOC).[[47]](#footnote-47) Per each SOC code, two annual employment data points are projected (for years 2015 and 2023), as well as average annual openings (a result of growth and replacement), or employment needs. It is noted that the data does not reveal a total breakout per major category, since the numbers do not add up into the three major educational categories; hence some relative percentages are not represented in full detail. The educational attainment in the Department of Economic Opportunity data is provided on six current levels of education, of which only three levels apply to the present study, namely: Postsecondary Vocational Education, Associate Degree and Bachelor’s Degree. Only the relevant and corresponding projected employment data (for both 2015 and 2023), and the average annual openings data, is selected for the present study.

In order to present employment, and especially projected employment needs per NAICS, a 1,427 row (SOC) by 1,618 column (NAICS) matrix was set up to map the crosswalk between SOC and NAICS, using the National Crosswalk Service Center SOC to NAICS crosswalk.[[48]](#footnote-48) This matrix was used to calculate employment (2015), employment projections (2023) and average annual openings in terms of NAICS. The results are aggregated to the major NAICS groups and adjusted or normalized to both the NETS and Department of Economic Opportunity (DEO) data.

Next, the Florida College data was collected (per individual State College) from the National Center for Education Statistics (NCES; IPEDS Data Center),[[49]](#footnote-49) which provided: CIP codes,[[50]](#footnote-50) program name, award level (five levels) and graduate counts. Instead of using the most recent year available only, three years: FY 2011-12, 2012-13 and 2013-14 (most recent available data at the time the analysis was performed), were collected and used, which represented a fuller picture of the offered programs at each College. The downside to this approach is that programs may be used in the analyses that are abandoned as per the latter years where no graduate student numbers are showing, and that the average annual student count is a tad lower than in the graduate student count final year, in case of increasing student graduation counts (and vice versa). No attempt is made by the research team to extrapolate graduate student counts to FY 2014-15 (in many cases none can be made due to one data point only), hence the comparison tables will show an actual average graduate count for the previously mentioned three years, and three levels of graduates, or average annual employment, as per the Department of Economic Opportunity projections.

To match the CIP to the SOC codes, the National Center for Education Statistics (NCES), SOC to CIP crosswalk was used.[[51]](#footnote-51),[[52]](#footnote-52) In this case, a 969 row (SOC) by 1,382 column (CIP) matrix was set up to match combinations from the crosswalk. The results were adjusted or normalized to the Department of Economic Opportunity data (projected average annual openings). This approach opens up two different approaches to the Gap analyses: a gap between student levels present (the averages as mentioned), further defined as “employment supply”, and the average annual projected, or graduate “demand” per the existing or utilized College programs. The second, or alternative method, uses “all college programs,” (or CIPs) available in the FCS area.

**Limitations of the Data**

One of the largest setbacks in data encountered for in these analyses is the inconsistent use or even absence of standardized program coding (or even available descriptors of coding). Although this is in part an overarching issue (e.g. the SOC to CIP Crosswalk), it is clear, however, that Colleges use their own coding systems, and additions to coding systems for “labeling” studies. It is recognized that some flexibility is warranted given emerging and cross-disciplinary programs, but for the bulk of programs standardization in coding should not be an issue. In addition, part of the same coding should be educational attainment as there presently is no mechanism to categorize data to the various degree levels. In short, the program coding and description needs to be better standardized.

In addition, more detailed data on regional wages would be an asset in conducting further similar studies or analyses. The wage differentials signal “gaps” in the labor market, which represent similar gaps that Colleges use for areas of program or curriculum development. Finally, concerning the commuting worker flow, there is limited data from the United States Census Bureau.[[53]](#footnote-53) The commuter data does not come with SOC, CIP or NAICS coding, hence it cannot be linked with any of the collected data. No attempt was made by the CEFA research team to extrapolate or break out an absolute or relative number for matching commute patterns in-between the FCS areas and it is up to the reader to make possible connections/deductions as to the incentives or reasons behind the commute. The purpose for mentioning the commute is that it is a significant component of labor market dynamics.

# Appendix 3. The Florida College System (FCS) Contacts

|  |  |  |
| --- | --- | --- |
| **Broward College** | | |
|  | **Mr. J. David Armstrong, Jr.**  111 Las Olas Blvd  Ft. Lauderdale, FL 33301  [darmstro@broward.edu](mailto:darmstro@broward.edu)  Phone: (954) 201-7401  Fax: (954) 201-7357 | Kate Fisher -Senior Executive Assistant to President  [kfisher@broward.edu](mailto:amccoy@broward.edu)  [www.broward.edu](http://www.broward.edu/)  Board Chair: John Benz (5) |
|  |  |  |
| **Chipola College** | | |
|  | **Dr. Sarah Clemmons (Interim)**  3 094 Indian Circle  Marianna, FL 32446-2053  [clemmonss@chipola.edu](mailto:hurstj@chipola.edu)  Phone: (850) 718-2201  Fax: (850) 718-2388 | Alice Pendergrass - Executive Assistant  [pendergrassa@chipola.edu](mailto:pendergrassa@chipola.edu)  [www.chipola.edu](http://www.chipola.edu/)  Board Chair: Danny Ryals (9) |
|  |  |  |
| **College of Central Florida** | | |
|  | **Dr. James D. Henningsen**  3 001 SW College Rd.  Ocala, FL 34474  [jim.henningsen@cf.edu](mailto:jim.henningsen@cf.edu)  Phone: (352) 873-5835  Fax: (352) 873-5847 | Cherie Ross - Executive Assistant  [rossc@cf.edu](mailto:rossc@cf.edu)  [www.cf.edu](http://www.cf.edu/)  Board Chair: Robert Durrance (7) |
|  |  |  |
| **Daytona State College** | | |
|  | **Dr. Tom LoBasso**  P O Box 2811  Daytona Beach, FL 32120-2811  thomas.lobasso@daytonastate.edu  Phone: (386) 506-4408  Fax: (386) 506-4440 | Lynn Mercer - Executive Secretary  Lynn.[mercer@daytonastate.edu](mailto:mercerl@daytonastate.edu)  [www.daytonastate.edu](http://www.daytonastate.edu/)  Board Chair: Forough B. Hosseini (9) |
|  |  |  |
| **Eastern Florida State College** | | |
|  | **Dr. James Richey**  1519 Clearlake Road  Cocoa, FL 32922  [richeyj@easternflorida.edu](mailto:richeyj@easternflorida.edu)  Phone: (321) 433-7000  Fax: (321) 433-7005 | Gina Cline - Executive Asst to President  clineg@easternflorida.edu  [www.easternflorida.edu](http://www.easternflorida.edu)  Board Chair: Stephen G. Charpentier (5) |
|  |  |  |
| **Florida Gateway College** | | |
|  | **Dr. Lawrence Barrett**  149 SE College Place  Lake City, FL 32025-2007  [lawrence.barrett@fgc.ed](mailto:charles.hall@fgc.ed)u  Phone: (386) 754-4200  Fax: (386) 754-4593 | Karyn Congressi - Assistant to the President  [Karyn.congressi@fgc.edu](mailto:Karyn.congressi@fgc.edu)  [www.fgc.edu](http://www.fgc.edu/)  Board Chair: Suzanne Norris (9) |
|  |  |  |
| **Florida Keys Community College** | | |
|  | **Dr. Jonathan Gueverra**  5901 College Road  Key West, FL 33040-4397  [jonathan.gueverra@fkcc.edu](mailto:jonathan.gueverra@fkcc.edu)  Phone: (305) 809-3204  Fax: (305) 292-5155 | Debbie Leonard - Director, President’s Office  [debbie.leonard@fkcc.edu](mailto:debbie.leonard@fkcc.edu)  [www.fkcc.edu](http://www.fkcc.edu/)  Board Chair: Stephanie Scuderi (7) |
|  |  |  |
| **Florida SouthWestern State College** | | |
|  | **Dr. Jeffery Allbritten**  8099 College Parkway  Ft. Myers, FL 33919  [jeffery.allbritten@fsw.edu](mailto:jeffery.allbritten@fsw.edu)  Phone: (239) 489-9211  Fax: (239) 489-9341 | Danessa Stevens - Project Coordinator  [danessa.stevens@fsw.edu](mailto:danessa.stevens@fsw.edu)  [www.fsw.edu](http://www.fsw.edu/)  Board Chair: Brian Chapman (9) |
|  |  |  |
| **Florida State College at Jacksonville** | | |
|  | **Dr. Cynthia Bioteau**  501 W State Street  Jacksonville, FL 32202  [cbioteau@fscj.edu](mailto:cbioteau@fscj.edu)  Phone: (904) 632-3222  Fax: (904) 632-3393 | Lisa Parker - Executive Assistant  [lisa.parker@fscj.edu](mailto:lisa.parker@fscj.edu)  [www.fscj.edu](http://www.fscj.edu/)  Board Chair: Randle P. Shoemaker, J.D (9) |
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| **Gulf Coast State College** | | |
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1. Formal definition for NAICS 56: Administrative and Support and Waste Management and Remediation Services. [↑](#footnote-ref-1)
2. Information taken from http://www.myafchome.org/cop and from Visions, The Journal of Applied Research for The Association of Florida Colleges, Volume VII, Issue 1, Winter 2015. Retrieved from <file:///C:/Users/Owner/AppData/Local/Microsoft/Windows/INetCache/IE/EM9NVW4A/2015visions.pdf> [↑](#footnote-ref-2)
3. The study, performed by WalletHub, identified the best and worst community colleges of the U.S. Their methodology involved a sample of 821 institutions according to 12 key metrics. Data used to create these rankings were collected from the National Center for Education Statistics, Council for Community and Economic Research and College Measures. See: <https://wallethub.com/edu/states-with-best-worst-community-college-systems/15073/> [↑](#footnote-ref-3)
4. Jenkins, D. and J. Fink. 2016. Tracking Transfer: New Measures of Institutional and State Effectiveness in Helping Community College Students Attain Bachelor’s Degrees. CCRC, The Aspen Institute, and the NSCRC. See: <http://ccrc.tc.columbia.edu/publications/tracking-transfer-institutional-state-effectiveness.html> [↑](#footnote-ref-4)
5. http://www.helios.org/news-media/news/statement-on-the-florida-higher-education-coordinating-council-s-adoption-of-a-postsecondary-attainment-goal [↑](#footnote-ref-5)
6. Florida Chamber Foundation. 2016. From Excuses to Excellence. See:<http://www.flchamber.com/research/research-programs/from-excuses-to-excellence/> [↑](#footnote-ref-6)
7. Data retrieved from the FCS Fact Book 2016: see: <http://www.fldoe.org/core/fileparse.php/15267/urlt/FactBook2016.pdf>, and; Jenkins, D. and J. Fink. 2016. Tracking Transfer: New Measures of Institutional and State Effectiveness in Helping Community College Students Attain Bachelor’s Degrees. CCRC [↑](#footnote-ref-7)
8. This paragraph is, unless otherwise indicated, based on data retrieved from: <http://www.census.gov/quickfacts/table/PST045215/12> [↑](#footnote-ref-8)
9. Labor Force data point July 2015, taken from <http://freida.labormarketinfo.com>. At the same point in time employment is estimated at 9,149,000, unemployment at 563,000 or 5.8 percent. [↑](#footnote-ref-9)
10. A short-term view is chosen to portray the current or present dynamics which is reflective of the shorter-term perspective of this Gap Analysis study. [↑](#footnote-ref-10)
11. The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. The typical denomination for the data is not industries but sectors. In the main text, these terms may be used interchangeably. Repeated sector labels are custom as the decimal system runs out of space to categorize different e.g. Manufacturing sub-categories, where there is no standard term in use to distinguish the first ten from the second ten sub-sectors.

    Data used here is from the National Establishment Time Series (NETS) Database. The National Establishment Time-Series (NETS) Database is a time-series database on establishment information. NETS provide longitudinal data on various dynamics of the U.S. economy that include establishment job creation and destruction, sales growth performance, survivability of business startups, mobility patterns, changes in primary markets, corporate affiliations that highlight M&A, and historical D&B credit and payment ratings. It contains information on some 4.5 million unique establishments in Florida, businesses, non-profit and government, between 1990 and 2013.

    The NETS database is the most important database available on the subject, providing data beyond the capacity of the Bureau of Economic Analyses and the Bureau of Labor Statistics, or even CareerSource and DEO.

    Next, the FSU Research Team opted to use NAICS, as it is Sectors that will need employment. This perception is lost where mere occupation codes are presented. Education after all is not about acquiring knowledge and skills to fill an occupation, but to perform in a specific (yet unknown) industry environment. [↑](#footnote-ref-11)
12. Estimates based on the NETS database time-series from 1990 through 2013 (NETS release 2013). [↑](#footnote-ref-12)
13. Florida Labor Market Statistics (LMS) produces projections of all 24 Local Workforce Development Areas (LWDA) each year by first projecting industry employment which is done at the detailed industry level for 12 regions using a historic industry database from 1972. For industry projections, LMS uses the Projections Managing Partnership (PMP) software. The PMP is a consortium of states with the Bureau of Labor Statistics (BLS) who maintain the PMP software. Analysts use the PMP Long-Term Industry Projections module to produce projections for the 12 regions using a mix of regression and shift-share models. Over 30 models are available for each industry. Industry projections are selected by an analyst and then reviewed by the LMS projections team to set the final models and employment levels. State projections are produced first and then used as an independent variable in the regional models. There are 300 industry levels for statewide and in each region, so each year approximately 3,900 models must be selected and reviewed. Base years are adjusted to reflect the most recent changes in industry employment by area. After the projection, region industry levels are finalized, and factored out to various geographic configurations using detailed industry employment. This is done for LWDAs, large counties, and Florida College System areas. Industry staffing patterns based on BLS metro area survey data are used to produce the occupational projections. The staffing pattern is the ratio of occupational employment to industry employment derived from a massive survey of employers conducted by LMS under BLS technical guidance. Job openings due to growth and replacement needs are produced by occupation in the occupational projections process. Replacement openings are created when workers change occupations, retire or leave the labor force. The final published tables contain industry and occupational projections for all 24 LWDAs, all large counties with over 100,000 base year employment and Florida College System areas. Projections are used to produce the statewide and LWDA Demand Occupations Lists. The next round of projections to be published early next year will be from 2016-2024. Personal communication, Sept. 2016, with George Foster, Economist Manager Occupational Employment Statistics & Employment Projections, Department of Economic Opportunity. [↑](#footnote-ref-13)
14. The recalibration was conducted as a means for improved readability. [↑](#footnote-ref-14)
15. DEO Employment Projections (2015-2023), data retrieved from <http://www.floridajobs.org/labor-market-information/data-center/statistical-programs/employment-projections> [↑](#footnote-ref-15)
16. Rather than using calculus to correct the differentials the CEFA research team opted to use the actual data. [↑](#footnote-ref-16)
17. DEO Employment Projections (2015-2023) and SOC to NAICS crosswalk. National Crosswalk Service Center SOC to NAICS crosswalk**, Occupation-to-Industry Linkages (updated to latest information: 2010 SOC, 2012 NAICS)**,retrieved from <http://www.xwalkcenter.org/index.php/classifications/crosswalks>

    For a description of the methodology used by FSU-CEFA, see Appendix 2. [↑](#footnote-ref-17)
18. See also Table 1 in NAICS. Observed differences between Table 3 and Table 1 are due to source differences. [↑](#footnote-ref-18)
19. When compared with the employment needs by industry code (NAICS) in Table 3. [↑](#footnote-ref-19)
20. Which are equivalent to the center column in Table 4. [↑](#footnote-ref-20)
21. In the following Gap Analyses, it should be noted that graduating students may be a major supply for jobs, but are not the only source of labor supply. Among several labor supply sources are the unemployed and commuters from areas. beyond the service areas under analyses. Unemployment data may also provide important context when identifying the training programs that are best suited to transitioning unemployed workers into in-demand occupations. It is beyond the scope of this Gap Analysis to account for in- and outflow commuter patterns. In the following Gap Analyses, it is assumed by the CEFA research team that the demand and supply of employment is derived by the FCS graduate population. [↑](#footnote-ref-21)
22. National Crosswalk Service Center SOC to NAICS crosswalk, **Occupation-to-Training Classification Crosswalks,** retrieved from <http://www.xwalkcenter.org/index.php/classifications/crosswalks> [↑](#footnote-ref-22)
23. The FSU Research Team did not pursue enhancement of the available SOC-to-CIP crosswalk, as there are 1.3 million potential combinations that may need attention. There were some codes that could not be matched, mainly due to blanks on either side of the crosswalk. [↑](#footnote-ref-23)
24. National Center for Education Statistics (NCES), data retrieved for years 2011-12, 2012-13 and 2013-14; <http://nces.ed.gov/ipeds/datacenter/Default.aspx> and <http://nces.ed.gov/ipeds/datacenter/InstitutionProfile.aspx?unitid=acaeb0b2acb2> [↑](#footnote-ref-24)
25. The most recent data available at the time of this study. [↑](#footnote-ref-25)
26. The count mentioned does not include the unmatched 24,850 (due to blanks on either side of the crosswalk). [↑](#footnote-ref-26)
27. A full table on six-digit CIP codes with the same set-up is provided in Appendix 1, for further 6-digit detail. [↑](#footnote-ref-27)
28. Each main CIP mentioned accounts for gaps over 10,000 [↑](#footnote-ref-28)
29. Each CIP subcategory accounts for gaps over 2,500 [↑](#footnote-ref-29)
30. The differences between Table 5 and 6 are due to marginal categories not included in the DEO Employment Projections both per county/workforce area and per college service area respectively, as well as in growth and replacement differentials. Hence the sum of the parts in Table 6, doesn’t exactly equal the total in Table 5. [↑](#footnote-ref-30)
31. The Survey Monkey survey was developed by Eileen Johnson, Director of Finance and Administration, AFC. [↑](#footnote-ref-31)
32. It is recommended to review each individual college report for college-specific observations and responses. [↑](#footnote-ref-32)
33. There may be some minor redundancy in individual FSC IR/IE responses in this list, however, it also assists in identifying trends in the responses. [↑](#footnote-ref-33)
34. United States Census, (data is inflation adjusted per year, but not over the years), data retrieved from: <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_B20004&prodType=table> [↑](#footnote-ref-34)
35. The following student count was used: for College <2 years = 25,944, for Some College or Associate’s 2-<4 years= 71,599 and for Bachelor’s = 4,768 (as per IEPD average of FCS graduates for years 2011-2014). [↑](#footnote-ref-35)
36. Source: Fact Book 2016, <http://fldoe.org/accountability/data-sys/CCTCMIS/fl-college-data-info-sys/fact-books.stml> [↑](#footnote-ref-36)
37. Note that these economic measures are independent and should not be summed together. [↑](#footnote-ref-37)
38. The DEO Employment projections do not include certain marginal categories, and growth and replacement differentials (per county/workforce area and per college service area respectively). [↑](#footnote-ref-38)
39. Data for 2011-2012, 2012-2013 and 2013-2014 were the most recent data available when CEFA staff performed the analysis for all the state colleges. [↑](#footnote-ref-39)
40. As mentioned earlier in the report, it should be noted that FCS graduates are not the only source of labor supply. [↑](#footnote-ref-40)
41. Subcategory refers to additional detail in the CIP program codes (to the 4-digit level). [↑](#footnote-ref-41)
42. Each sub CIP category with gaps of over 2,500 [↑](#footnote-ref-42)
43. Note that these economic measures are independent and should not be summed together. [↑](#footnote-ref-43)
44. The National Establishment Time-Series (NETS) Database is a time-series database on establishment information. NETS provides longitudinal data on various dynamics of the U.S. economy that include establishment job creation and destruction, sales growth performance, survivability of business startups, mobility patterns, changes in primary markets, corporate affiliations that highlight M&A, and historical D&B credit and payment ratings. It contains information on some 4.5 million unique establishments in Florida, businesses, non-profit and government, between 1990 and 2013. [↑](#footnote-ref-44)
45. Federal Information Processing Standard (FIPS) is a United States federal government system standard used to accredit cryptographic modules by non-military government agencies and government contractors. [↑](#footnote-ref-45)
46. The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. [↑](#footnote-ref-46)
47. See Footnote 5 earlier in the text.

    The Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. [↑](#footnote-ref-47)
48. National Crosswalk Service Center SOC to NAICS crosswalk**, Occupation-to-Industry Linkages (updated to latest information: 2010 SOC, 2012 NAICS)**,retrieved from: <http://www.xwalkcenter.org/index.php/classifications/crosswalks> [↑](#footnote-ref-48)
49. Data retrieved from: <http://nces.ed.gov/ipeds/datacenter/> [↑](#footnote-ref-49)
50. Classification of Instructional Programs (CIP). The purpose of the Classification of Instructional Programs is to provide a taxonomic scheme that will support the accurate tracking, assessment, and reporting of fields of study and program completions activity. [↑](#footnote-ref-50)
51. National Center for Education Statistics (NCES), **Classification of Instructional Programs (CIP),** CIP to SOC Crosswalk, retrieved from <http://nces.ed.gov/ipeds/cipcode/resources.aspx?y=55> [↑](#footnote-ref-51)
52. It should be noted that: this analysis does not include an analysis of CIP code 24 because the primary focus of students who earn an Associate in Arts degree is to transfer to colleges or universities to continue their education. [↑](#footnote-ref-52)
53. United States Census Bureau: Commuting (Journey to Work) Worker Flows, 2009-2013 5-Year American Community Survey, Table 1. Data retrieved from: <http://www.census.gov/hhes/commuting/data/commutingflows.html> [↑](#footnote-ref-53)