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# MCHENRY COUNTY COLLEGE

Environmental Scan - 2016



NORTHERN ILLINOIS UNIVERSITY

**Center for  
Governmental Studies**

*Outreach, Engagement, and Regional Development*

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The findings and conclusions presented in this report are those of the authors alone and do not necessarily reflect the views, opinions, or policies of the officers and/or trustees of Northern Illinois University.

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## **SECTION 1: EXECUTIVE SUMMARY**

The demographic changes in Illinois and the McHenry County College district are permeating every neighborhood. Birth rates have been declining, young couples are waiting longer to have children, recovery from the 2008 recession has yet to return to pre-recession levels, and the housing industry still struggles to return. School enrollments are declining while the student body is experiencing for the first time that minorities are the majority. Funding for public schools and higher education is being reduced and threatened with further cuts.

However, there are many shining stars that will assist in overcoming challenging times. The McHenry County College district is breaking from the Illinois norm and seeing a slight uptick in the birth rate along with having a young housing stock available which is more attractive to younger buyers. While the median age of the district is higher than statewide, the County is positioned to attract families who are seeking energy efficient homes that are more affordable. Due to the housing crisis, the construction industry was reduced to rubble, but is now making a strong come-back in the district making it an attractive market for education. The manufacturing industry has been declining in numbers for many years due to the influx of newer technologies, but because it is an older industry there will be a need for numerous replacement workers within the industry due to retirements that will require a trained workforce. Since the baby boomer generation is now demanding a high level of health services there are opportunities for increasing the training available to fill the increased demand of hospitals and clinics throughout the County.

Since 2008 many of the baby boomers lost their nest egg for retirement and thus stayed in the workforce longer tying up positions that would have been available to the younger generations. However, many are retiring now which will help to turn around the higher unemployment rates of those trying to enter the workforce. The increased availability of entry level positions in the workforce will enable graduates to secure financially stable futures.

There is no doubt that much of the economy hangs in the balance as the recovery has been slow in comparison to previous recessions. Maintaining a focus on where the district will be in the next ten years will be crucial in responding to the needs and demands of graduates.

## SECTION 2: INTRODUCTION

McHenry County College's (MCC's) current strategic planning and continuous improvement process began in 2006 when it joined the national Academic Quality Improvement Program (AQIP). In 2010, the College's Educational Master Plan for 2011-2015 was unveiled, integrating the institution's Core Principles, Academic Plan, presidential goals, and the AQIP Systems Appraisal Portfolio.<sup>1</sup> Rebranding for MCC was a related initiative that aligned with this process, and, in 2011, the core values of *Change Ready*, *Quality*, and *Community* were introduced. These values were informed by input from current and prospective students, faculty and staff, alumni, high school guidance counselors, workforce and community development affiliates, and other community partners and stakeholders. MCC utilized the first environmental scan published in 2012 to inform a renewed strategic planning process using this report to help identify district-wide trends.

Because of the strategic planning process in 2013, the College committed to focus on five core initiatives through 2018:

- Increase student engagement, completion, and success,
- Maintain the College's financial stability, and expand infrastructure and technology to establish state-of-the-art learning environments that inspire postsecondary education and career development,
- Ensure high-quality services and learning opportunities through a culture of continuous improvement, innovation, and accountability,
- Engage in partnerships that enable MCC students to succeed in a global economy, and
- Attract, develop, and retain quality instructors who are outstanding scholars/teachers and an excellent, diverse staff who are committed to the mission of MCC<sup>2</sup>.

In July 2016, Northern Illinois University's Center for Governmental Studies was contracted by MCC to conduct a second environmental scan. The report will be utilized to inform the new strategic planning process under the same branding elements as the 2013 report.

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<sup>1</sup> McHenry County College Master Plan, August 2011, <http://www.mchenry.edu/emp/>

<sup>2</sup> McHenry County College Strategic Plan, August 2013, <http://www.mchenry.edu/strategicplan/>

## **Purpose of the Report**

The purpose of this environmental scan is to identify data that may be helpful to consider in making informed decisions about the current and future operation of MCC. A wide range of data sources addressing economic, demographic, educational, and workforce trends has been reviewed, and those that are most relevant to the three core values identified for MCC's branding have been included. While a level of subjectivity is involved in selecting which data elements to include, the intent is to stimulate conversation among MCC stakeholders rather than to present an exhaustive inventory of available data or propose causal relationships. McHenry County College has access to high quality data through its partners, such as the McHenry County Workforce Investment Board, and through its own internal continuous improvement processes. As a result, MCC is in the best position to identify the more nuanced short- and long-term implications of the trends and characteristics included in this report. Potential uses of this scan are to validate or modify strategic directions, identify emerging issues to explore further, and educate MCC faculty, staff, and stakeholders about the environment in which MCC operates. All three of these uses can contribute to the knowledge and insight needed for MCC's continuous improvement journey.

## **Report Organization**

Following a brief description of the geographic and population context of MCC, a section is dedicated to each of the three branding values: change ready, community, and quality. While many tables and charts are included in the body of the report for easy reference, several lengthy tables have been incorporated as appendices. All the data referenced in this report has been provided to MCC in an electronic format so it may be updated and sorted in various ways by the College.

MCC's three brand attributes of "change ready", "community", and "quality" flow from the College's brand pledge of making "a valuable difference in our community by inspiring, engaging, and transforming learners through quality meaningful educational opportunities."<sup>3</sup>

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<sup>3</sup> McHenry County College Office of Marketing and Public Relations (2012). *Official Brand and Style Guidelines*.

It is about the promise that MCC makes to its audiences and how well it delivers on that promise.

These are powerful marketing messages and challenging ideas around which to organize an environmental scan. After reviewing several documents produced by MCC, available reports and analyses developed by regional and local partners on trends, and the various public and proprietary databases to which CGS has access, each of these brand attributes was expanded upon so they could be more readily connected to information that describes the external environment in which MCC operates. These expanded definitions are presented below to help articulate the framework used for this scan and identify any irregular relationships which may need to be addressed.

“Change ready” is defined as the capacity to identify and act on opportunities to be more responsive, innovative, and agile in meeting student and stakeholder needs. It requires a willingness to take risk and be proactive rather than reactive, and to anticipate where the institution needs to be in five years rather than focus exclusively on today’s needs. “Change ready” is an institutional attribute and value that is modeled by leadership and fostered and supported by every member of the organization. MCC’s ability to be change ready will be driven largely by enrollment demands and the workforce-related expectations of students and employers, so the data presented for this attribute focus on overall enrollments, industry/occupational, and commuter trends.

“Community” addresses MCC’s commitment to building a community of learners whose learning takes place within and outside of the MCC campus. To do this will require that all MCC students, faculty, and administrators embrace the range of learning needs and aspirations that are brought to such an enterprise, and to celebrate diverse backgrounds, heritages, and experiences. It will also require providing each learner with access to the resources needed to participate fully in available learning opportunities. Data presented for this attribute emphasize changes in demographic characteristics, income and financial need, and readiness to learn.

“Quality” is producing educational outputs and outcomes that meet or exceed the expectations of students, employers, and the community as well as contributing to the quality

of life in McHenry County. Information presented for this attribute address accountability, technology, readiness to learn, and return on investment.

### **SECTION 3: GEOGRAPHY AND POPULATION**

McHenry County College is in northeast Illinois on the Wisconsin border. MCC's district covers most of McHenry County and a small part of Boone, Lake, and Kane counties. There are 30 incorporated municipalities and two unincorporated Census Designated Places<sup>4</sup> (CDPs), Pistakee Highlands and Chemung. In Wisconsin, two counties are on the border of the district, Walworth, and Kenosha Counties. McHenry County contains 18 K-12 school districts with 76 schools; nine of the districts are public high school districts comprised of 14 individual public high schools. Additionally, there is one private high school in the county.<sup>5</sup>

MCC's boundaries were drawn many years ago, based upon K-12 school district boundaries and were not intended to be contiguous with the county border (see Figure 1 on the next page). However, because MCC's district closely aligns<sup>6</sup> with that of McHenry County, county level data is used throughout this report.

McHenry County is located on the western edge of the Chicago urbanized area and is included in the Chicago Metropolitan Statistical Area (MSA)<sup>7</sup>. The county encompasses approximately 603 square miles and only 1.3% is water-based. About 35% of the County is incorporated leaving 65% as still rural. In 2015, the county had a population of about 307,000.

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<sup>4</sup> CDPs are areas with concentrations of people that are not incorporated, but are recognized by the Census for customized data counts.

<sup>5</sup> McHenry County College Strategic Plan, August 2013, <http://www.mchenry.edu/strategicplan/> (p. 2)

<sup>6</sup> According to the 2015 Comprehensive Annual Financial Report, 97 percent of the district is in McHenry County (p. iii).

<sup>7</sup> A metropolitan area is defined as counties with more than 25% of the working population commuting towards a central city such as Chicago.

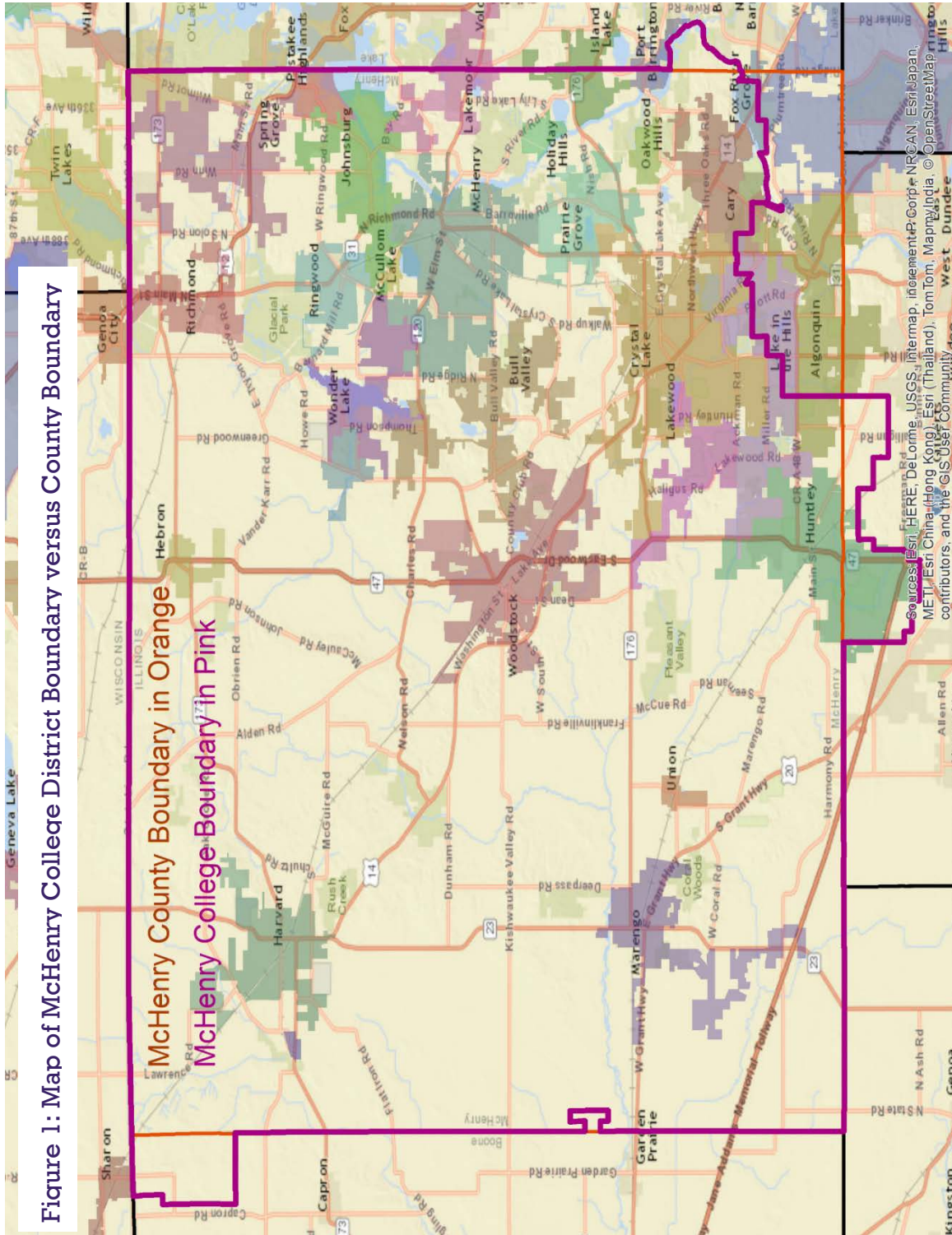
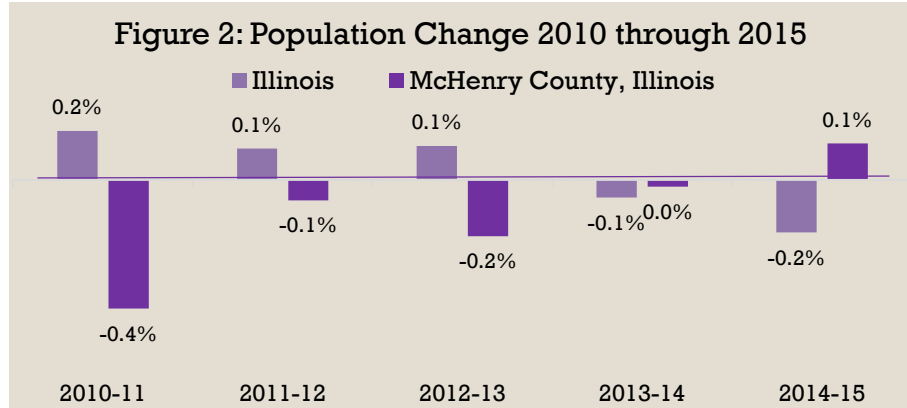


Figure 1: Map of McHenry College District Boundary versus County Boundary

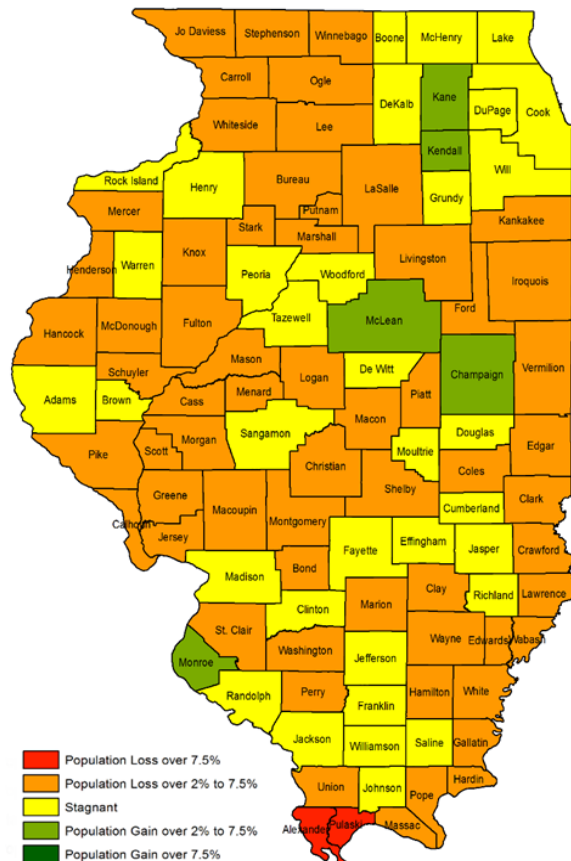
**Growth.** McHenry County experienced one of the highest rates of growth in Illinois between 2000 and 2010. However, since 2010 that growth stagnated. The county was home to 308,760 people, slightly



Source: U.S. Census Bureau, American Community Survey.

dropping to 307,343 people by 2015. This trend is not unusual in Illinois. The incoming residents from other states are no longer greater than those leaving Illinois. The trend has impacted almost every county since 2010. As a result of having a net statewide loss, only 17 out of 102 counties experienced any increase. McHenry County appears to be recovering; the greatest loss in population occurred in the period from 2010 to 2011 (-0.4%) and has been steadily improving since then with the last year ending on a positive note (see Figure 2). These are very small fluctuations when considering Illinois' overall decline in population these past two years a trend not experienced since the mid-1980s. McHenry is surrounded by other counties that have been stagnant with only small fluctuations; the only exceptions are Kane and Kendall counties who have gained 3% and 7.5%, respectively. See Figure 3 for full state population changes by county.

Figure 3: Statewide 2014-2015 Net Population Change



Source: U.S. Census Bureau, Population Estimates program.

The data does not explain the reason for the net population losses in the Chicago Metropolitan area but rather highlights a trend that is worth

monitoring since this area has had such strong growth in the past. There are additional factors contributing to this phenomenon that will be addressed throughout this report.

## **SECTION 4: CHANGE READY – Anticipating Changing Educational Needs of Our District**

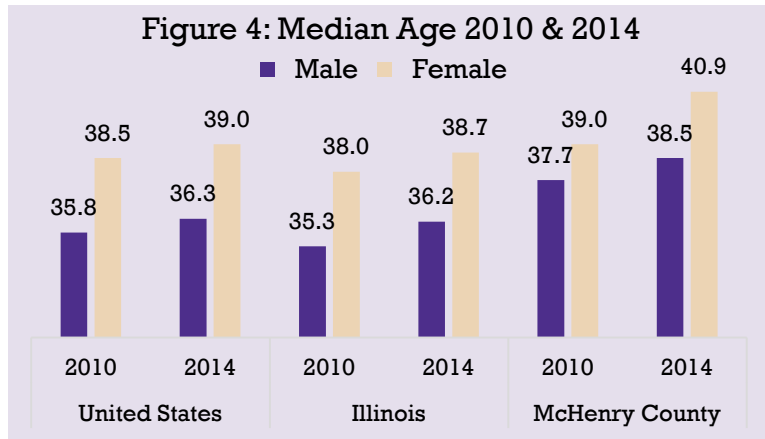
“Change ready” is the capacity to identify and act on opportunities to be more responsive, innovative, and agile in meeting student and stakeholder needs. It requires a willingness to take risk and be proactive rather than reactive, and to anticipate where the institution needs to be in five years rather than focus exclusively on today’s needs. “Change ready” is an institutional attribute and value that is modeled by leadership and fostered and supported by every member of the organization.

Characteristics of consumers of MCC’s educational services drive the types of programming and support services that are needed. Understanding the changing characteristics of the student population, both residents of McHenry County and workers who commute in, and of the employer base is key to anticipating their evolving needs.

**Age** is an important demographic factor to consider given that educational and support service needs vary depending on one’s stage of life. Large fluctuations in age cohorts impact local, state, and national social services. Health care has become the largest growing industry nationally to accommodate the increase in demand as the large population known as the baby Boomers retire and require a higher level of health care service. As our residents age the demand for services change from a focus on child care services to elder care and McHenry County has already been experiencing that transition. The median age of McHenry County residents increased from 34.2 in 2000 to 40.1 in 2014, reflecting an ageing population.



By comparison, the statewide median age was 34.7 in 2000 and 37.5 in 2014. Females tend to live longer, resulting in a higher median age than males. As can be seen in Figure 4 both males and females have trended much higher than Illinois or the nation overall. The national median age is currently 37.7 years.



Source: U.S. Census Bureau, 2014 One Year American Community Survey.

According to the National Center for Education Statistics (NCES), for two-year public institutions, 73% of the full-time students were under the age of 25; and 55% of the part-time students were under 25. The NCES reported that 60% of students at two-year public institutions were enrolled part-time.<sup>8</sup>

The five-year age distribution of McHenry residents is presented in Figure 5 on the next page as of 2014. The relatively large number of so-called “Millennials” (ages 18 -34) and Generation Xers (ages 35-50), combined, represent a sizeable traditional student market for MCC - a market in which the College has historically been successful in attracting enrollees.

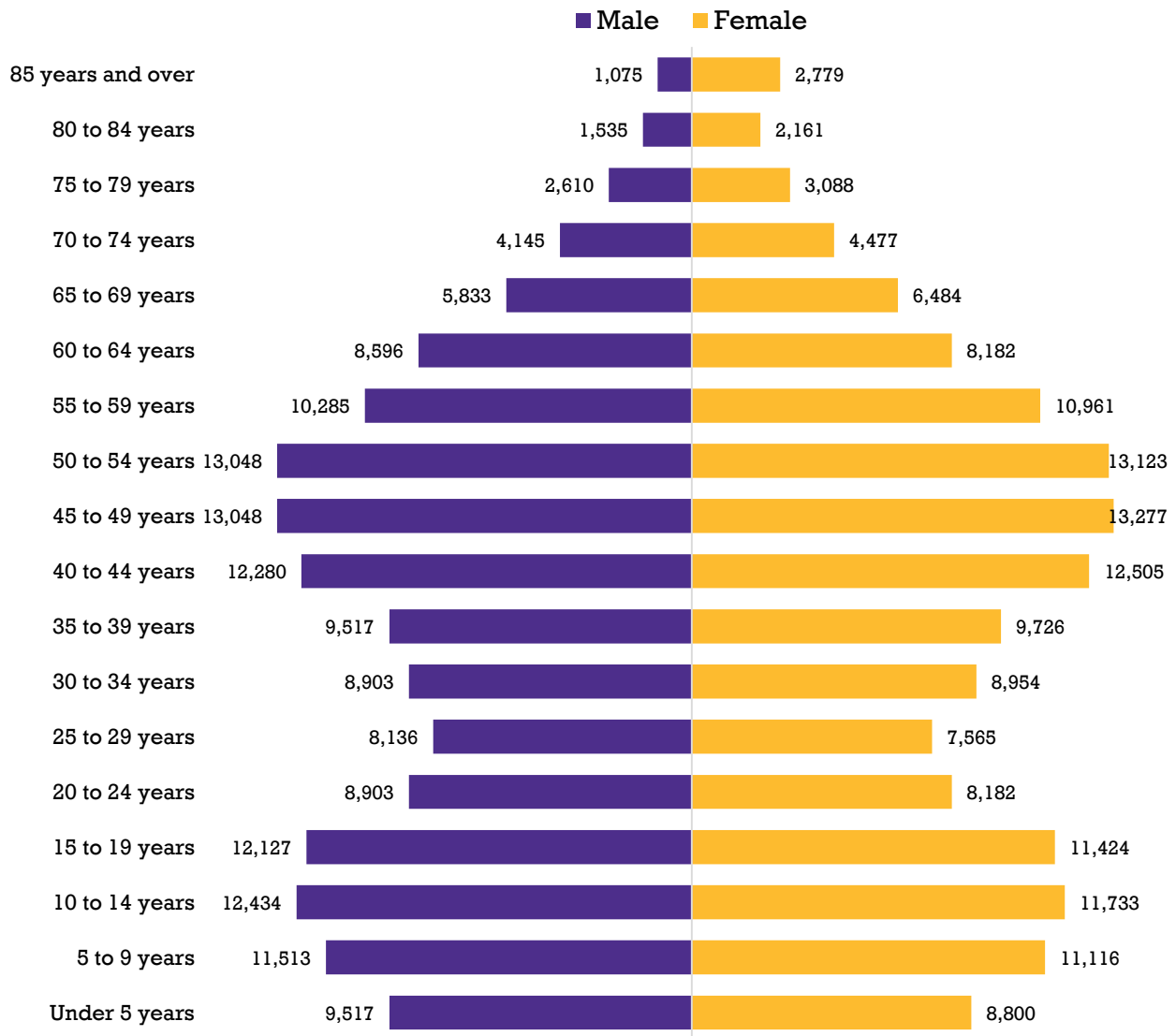
### HOW DOES GEN Z PREFER TO LEARN?

A study by Barnes & Noble College, the bookseller’s higher education retail division, finds that 51 percent of students in Gen Z—the cohort born between 1995 and 2010, now entering the college pipeline—like to learn by doing. (Thirty-eight percent say they are visual learners, while 12 percent say they learn best through listening.) “Gen Z wants engaging, interactive learning experiences,” the study says. Researchers found that, in the classroom, Gen Zers value the use of technology, hands-on learning, and individual attention.

How well does pedagogy at your institution support the learning modalities that resonate with Gen Z? How well are your learning spaces designed to support the ways Gen Z prefers to learn?

SCUP 2016.

Figure 5: Age Groups in McHenry County Population - 2014



Source: U.S. Census Bureau, 2014 One Year American Community Survey.

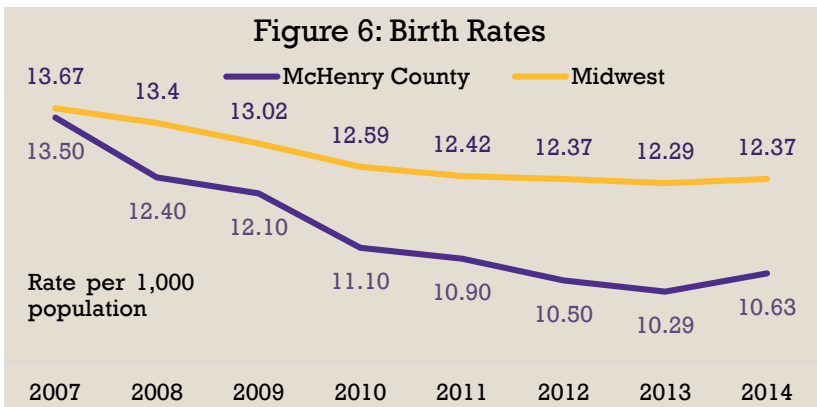
### Dependency Ratio

The dependency ratio is used as one indicator of the demand being put onto a local community based upon a ratio that separates those of working age (ages 18-65) from those that are not (under 18 or over 64 years old). In the last environmental scan, the dependency ratio for those under 18 was 59.5 in 2010. That means for every 100 workers they are supporting 59.5 people that are not yet of working age. The overall number declined slightly to 58.9 in 2014. The decline means there will be a slight relief in providing local funding for youth programs, such as education.

By 2014, the dependency ratio for retirement-aged residents (over 64 years old) ratio had increased to 19.2 from 16.9 in 2010<sup>9</sup>. This indicates an increase in the support required for those that are of retirement age. More pressure will be placed on the working group to aid those over the age 64 whose retirement funds are lacking. Additionally, communities whose public pensions have been underfunded could result in a loss of services and/or an increase in taxes at a time where resources are already scarce and the population is aging. This unfavorable scenario is negatively impacting credit ratings for the state of Illinois which may have a compounded adverse effect on public services needed for the elderly.

### Birth Rate

The birth rate across the Midwest as well as McHenry County has been on the decline for several years. Just in the last year some areas are experiencing a slight increase, which is a sign that families are growing. McHenry is one area that is having a slight uptick in the birth rate, but is still well below the overall Midwest



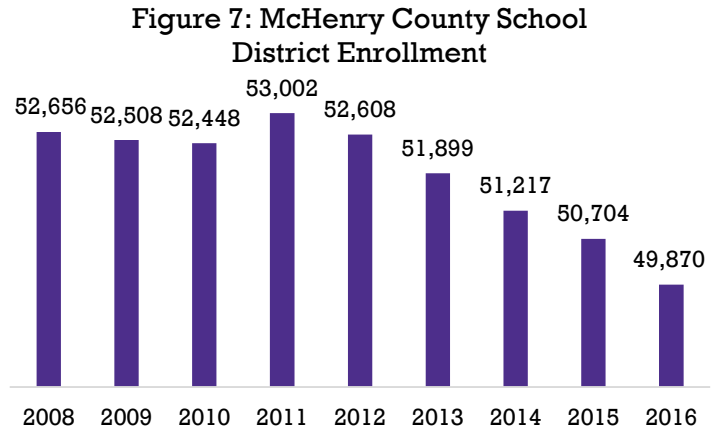
Source: Centers for Disease Control, WONDER

<sup>9</sup> Source: 2014 American Community Survey, U.S. Census Bureau

birth rate. The trend should be monitored as those numbers will eventually translate into a decline of graduating high school students eligible to enroll in college (see Figure 6).

### School District Enrollment

Figure 7 shows declining enrollments experienced throughout McHenry County’s schools. Cary CCSD 26 experienced a 21.6% decline in students since 2010, or a loss of 671 students. Harvey CUSD 50 had the largest increase (9.2%, or an additional 801 students). Overall,



Source: Illinois State Board of Education. Report Card.

there has been a 4.9% decline, or 2,534 fewer students in 2016 as there were in 2010. Most the declines have been in the elementary schools (2,478 students), primarily driven by the lower birth rates over the last ten years along with an ageing population.

District Name	2010	2011	2012	2013	2014	2015	2016
Consolidated SD 158	8,672	9,180	9,287	9,305	9,436	9,475	9,473
Harvard CUSD 50	2,295	2,456	2,440	2,413	2,423	2,502	2,518
McHenry CHSD 156	2,511	2,548	2,537	2,464	2,340	2,370	2,318
Woodstock CUSD 200	6,142	6,185	6,408	6,512	6,498	6,505	6,400
Richmond-Burton CHSD 157	772	794	788	766	781	758	715
CHSD 155	7,137	7,049	7,009	6,914	6,730	6,634	6,515
McHenry CCSD 15	4,878	4,897	4,846	4,717	4,725	4,654	4,519
Harrison SD 36	433	491	473	442	440	408	419
Marengo CHSD 154	869	831	820	772	775	745	772
Riley CCSD 18	310	308	300	308	301	310	310
Crystal Lake CCSD 47	8,540	8,409	8,214	8,092	7,892	7,765	7,604
Alden Hebron SD 19	426	457	450	444	450	456	425
Fox River Grove Cons SD 3	518	528	508	503	512	475	491
Johnsburg CUSD 12	2,388	2,365	2,334	2,247	2,157	2,073	1,976
Nippersink SD 2	1,475	1,467	1,400	1,336	1,270	1,228	1,183
Prairie Grove CSD 46	957	975	915	888	850	788	758
Marengo-Union E Cons D 165	1,016	1,060	1,083	1,121	1,102	1,069	1,036
Cary CCSD 26	3,109	3,002	2,796	2,655	2,535	2,489	2,438
<b>Total, All Districts</b>	<b>52,448</b>	<b>53,002</b>	<b>52,608</b>	<b>51,899</b>	<b>51,217</b>	<b>50,704</b>	<b>49,870</b>

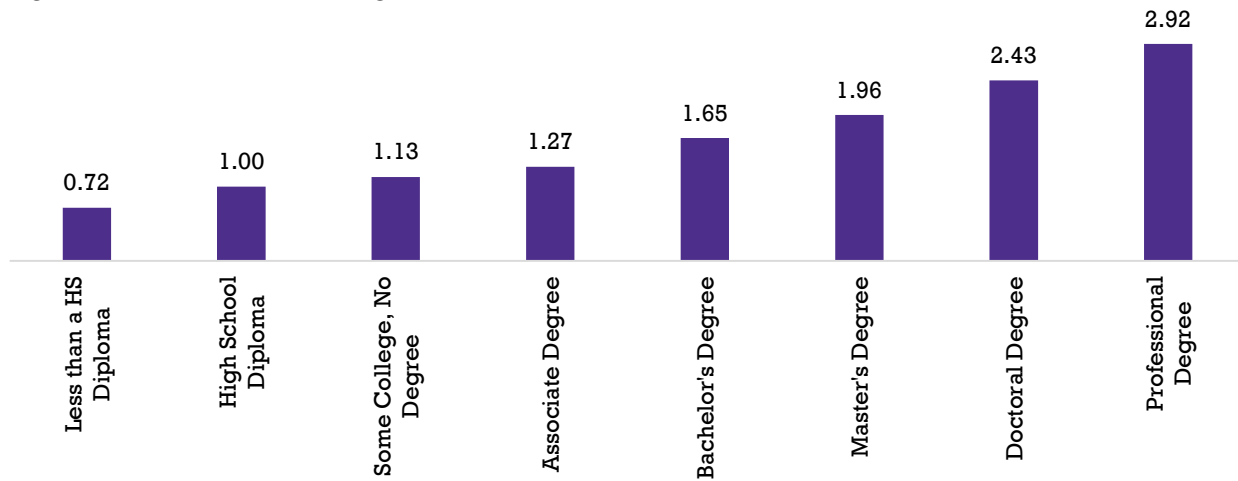
Source: Illinois State Board of Education, Report Card.

The high schools have gained 1,232 students over the same period. The gain by the unit school districts (869 additional students) certainly help to offset the loss of enrollments in the elementary grades. A reversal of the declining young students is not anticipated to change course in the near future. If the birth rate continues to stagnate the peak year for student enrollment was in 2011 (see Table 1).

### Educational Attainment

The progression in education is a strong determinant of lifetime earnings. Figure 8 shows the ratios at each level of education using High School graduate as the benchmark. If one earns a Bachelor’s degree it would be expected they would earn an average of 65% more in earnings over their lifetime than someone with a High School diploma. A primary finding by the College Board is that the assumption of those not enrolling in college due to a variety of barriers would, in fact, benefit from having those barriers lowered. The desire to succeed remains consistent but the barriers are very difficult overcome, such as reduced or eliminated financial aid<sup>10</sup>.

Figure 8: Lifetime Earnings Ratio by Education Attainment



Sources: U.S. Census Bureau, 2012, Table PINC-03; Baum, Sandy, Jennifer Ma and Kathleen Payea. Education Pays 2013: The Benefits of Higher Education for Individuals and Society. Published by: The College Board. 2013

<sup>10</sup> Baum, Sandy, Jennifer Ma and Kathleen Payea. Education Pays 2013: The Benefits of Higher Education for Individuals and Society. Published by: The College Board. 2013.

Table 2 shows education attainment by age groups. Those aged 18 to 24 are not broken down into higher education levels to maintain high reliability. Statewide educational attainment is slightly higher than in McHenry County for younger citizens (under 35 years old). For older age groups, McHenry County residents are more likely to have Associate or Bachelor’s degrees than other regions of the state. McHenry County residents are less likely to have earned a graduate or professional degree, regardless of age. The proportion of residents in every age category is higher than the statewide average for holding an Associate’s degree.

**Table 2: Education Attainment by Age, McHenry County, and the State of Illinois**

Age Groups by Area			No diploma	HS grad or GED	Some college	Higher degree	Associate’s degree	Bachelor’s degree	Grad or Prof degree
<b>18 -24 years</b>	<b>McHenry County</b>	Estimate	3,764	8,457	9,075	4,029	-	-	-
		% Age Category	<u>14.9%</u>	<u>33.4%</u>	35.8%	15.9%	-	-	-
	<b>Illinois</b>	% Age Category	14.1%	27.8%	<u>40.1%</u>	<u>18.0%</u>	-	-	--
<b>25-34 years</b>	<b>McHenry County</b>	Estimate	2,560	7,405	8,972	-	3,316	8,561	2,865
		% Age Category	7.6%	<u>22.0%</u>	<u>26.6%</u>	-	<u>9.8%</u>	25.4%	8.5%
	<b>Illinois</b>	% Age Category	<u>9.9%</u>	21.7%	21.7%	-	8.0%	<u>26.5%</u>	<u>12.2%</u>
<b>35-44 years</b>	<b>McHenry County</b>	Estimate	3,153	8,776	10,785	-	4,368	11,570	5,292
		% Age Category	7.2%	20.0%	<u>24.5%</u>	-	<u>9.9%</u>	<u>26.3%</u>	12.0%
	<b>Illinois</b>	% Age Category	<u>11.0%</u>	<u>23.1%</u>	20.8%	-	8.6%	22.4%	<u>14.1%</u>
<b>45-64 years</b>	<b>McHenry County</b>	Estimate	5,685	24,389	22,938	-	8,080	19,748	9,688
		% Age Category	6.3%	26.9%	<u>25.3%</u>	-	<u>8.9%</u>	<u>21.8%</u>	10.7%
	<b>Illinois</b>	% Age Category	<u>10.9%</u>	<u>27.4%</u>	22.4%	-	8.4%	18.7%	<u>12.3%</u>
<b>65 years and over</b>	<b>McHenry County</b>	Estimate	4,445	13,179	7,511	-	1,567	4,311	3,200
		% Age Category	13.0%	<u>38.5%</u>	<u>22.0%</u>	-	<u>4.6%</u>	<u>12.6%</u>	9.4%
	<b>Illinois</b>	% Age Category	<u>19.5%</u>	35.8%	18.7%	-	4.1%	12.0%	<u>9.9%</u>

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5 Year Estimate, Table B15001 (Sex by Age by Education Attainment), some categories (such as gender) were aggregated to reduce the margins of error as suggested by the Census Bureau publication:

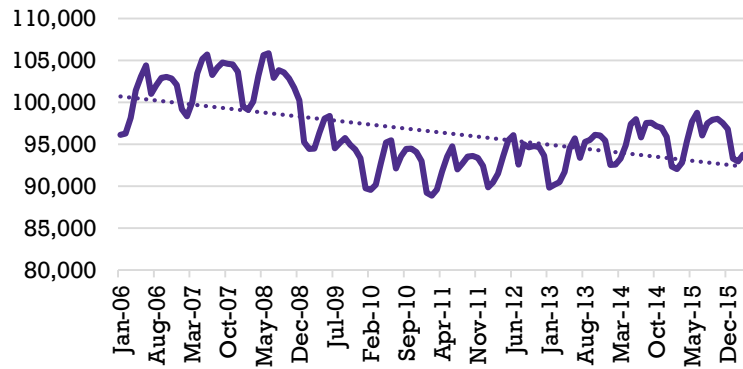
<http://www.census.gov/acs/www/Downloads/handbooks/ACSGeneralHandbook.pdf>

*Underlined are those percentages that are higher between McHenry County and Illinois for each age group/education attainment category.*

### Industry and Occupations

Employment follows a regular cycle each year as some layoffs tend to be seasonal (i.e., retail). Employment changes in McHenry County between 2006 and 2015 is presented in Figure 9. The trend line indicates the County’s employment dropped significantly when the recession hit in 2008 then gradually began to stabilize.

Figure 9: McHenry County Employment Time Series



Source: Illinois Department of Employment Security.

Table 3 provides the changes in employment by industry. A notable change was a 54.4% increase in Health Care and Social Assistance between 2000 and 2010 in response to the Baby Boomers reaching retirement age. The increase in Boomers generated a greater demand for services in this sector. Between 2010 and 2015, growth in that sector slowed to 2.5%, rising to a total employment level of 9,788. Similarly, Education Services exploded from 2000 to 2010 adding an additional 3,320 jobs (43.2% more jobs). Yet, in the subsequent five years that industry declined by 176 jobs (-1.6%). Manufacturing lost almost 31% of its labor force from 2000 to 2010, but the decline slowed to a negligible loss of 176 jobs (-1.6%) in the next five years. Other sectors adding significant jobs since 2010 include Administrative, Support, and Waste Management, Construction, Retail Trade, and Professional, Scientific, and Technical Services. Overall in McHenry County, after growing by 3,730 jobs (4.4%) in the 2000s, employment added just 890 (1.0%) new jobs from 2010 to 2015.

Table 3: McHenry County Employment by Industry

Industry Description	Employment			Change 2000 - 2010		Change 2010 - 2015	
	2000	2010	2015	Number	Percent	Number	Percent
<b>Administrative &amp; Support &amp; Waste Management &amp; Remediation Services</b>	2,823	4,959	5,672	2,136	75.7%	713	14.4%
<b>Construction</b>	7,441	4,833	5,401	-2,608	-35.0%	568	11.8%
<b>Health Care and Social Assistance</b>	6,185	9,550	9,788	3,365	54.4%	238	2.5%
<b>Retail Trade</b>	10,333	11,387	11,611	1,054	10.2%	224	2.0%
<b>Professional, Scientific, &amp; Technical Services</b>	2,918	2,971	3,154	53	1.8%	183	6.2%
<b>Accommodation &amp; Food Services</b>	5,313	6,354	6,505	1,041	19.6%	151	2.4%
<b>Transportation &amp; Warehousing</b>	1,656	1,304	1,405	-352	-21.3%	101	7.7%
<b>Other Services (except Public Administration)</b>	2,534	3,007	3,070	473	18.7%	63	2.1%
<b>Agriculture, Forestry, Fishing &amp; Hunting</b>	389	329	375	-60	-15.4%	46	14.0%
<b>Management of Companies &amp; Enterprises</b>	104	562	581	458	440.4%	19	3.4%
<b>Mining, Quarrying, &amp; Oil &amp; Gas Extraction</b>	83	30	34	-53	-63.9%	4	13.3%
<b>Arts, Entertainment, &amp; Recreation</b>	1,425	1,860	1,826	435	30.5%	-34	-1.8%
<b>Real Estate &amp; Rental &amp; Leasing</b>	856	620	571	-236	-27.6%	-49	-7.9%
<b>Finance &amp; Insurance</b>	1,777	2,156	2,074	379	21.3%	-82	-3.8%
<b>Public Administration</b>	2,919	3,898	3,790	979	33.5%	-108	-2.8%
<b>Educational Services</b>	7,682	11,002	10,826	3,320	43.2%	-176	-1.6%
<b>Manufacturing</b>	21,955	15,217	15,027	-6,738	-30.7%	-190	-1.2%
<b>Information</b>	1,655	1,329	1,134	-326	-19.7%	-195	-14.7%
<b>Wholesale Trade</b>	4,439	5,610	5,380	1,171	26.4%	-230	-4.1%
<b>Utilities</b>	1,582	821	465	-761	-48.1%	-356	-43.4%
<b>Total, All Industries</b>	<b>84,069</b>	<b>87,799</b>	<b>88,689</b>	<b>3,730</b>	<b>4.4%</b>	<b>890</b>	<b>1.0%</b>

Source: Illinois Department of Employment Security, Quarterly Workforce Indicators, Q1.



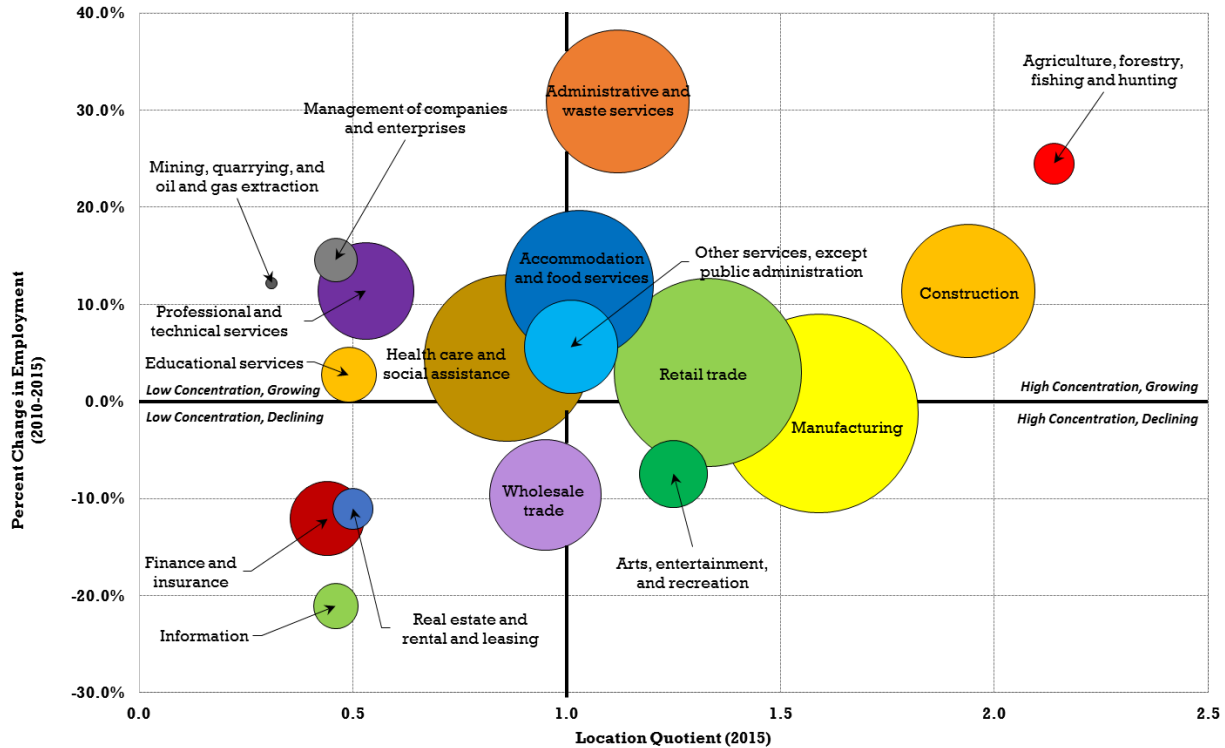
## Industry Concentrations

Specializations or concentrations of related industries are a widely recognized economic development phenomenon and play an important role in promoting and maintaining the vitality of cities, regions, and states. Location quotients (LQ) are one of several methodological tools used in research to quantify and compare concentrations of industries in a particular area to another and are critical for assessing an area's economic strengths and weaknesses. Location quotients are especially useful in identifying both the distinguishing industries and the commonalities between regional economies. They can serve to confirm the intuitively obvious or identify emerging trends as economies change, grow, and diversify. If the LQ is 1.0, that industry has the same share of employment as the U.S. If the LQ is greater than 1.0, it has a greater share of local area employment than the national average, and if less than 1.0, a smaller share. For example, the LQ for the entertainment industry in Los Angeles, California is well above 1.0 because of the high concentration of employment in that sector.

Industries with high LQs are usually export-oriented, which is important because they bring money into an area, rather than recirculate it like retail and food service operations do. LQs also help identify industries that distinguish McHenry County from the surrounding region.

Figure 10 shows both the relative concentration and growth in employment for the major industry sectors (represented by two-digit North American Industry Classification System or NAICS codes) in McHenry County. The size of the bubble represents the total employment within that industry. The horizontal axis represents the 2015 location quotient while the vertical axis represents the percentage growth between 2010 and 2015. The graph is also divided into four quadrants that represent the difference in the employment concentration and growth trends of each industry.

Figure 10: Industry Employment Concentration and Growth, 2010-2015  
McHenry County, Illinois



\*Utilities and Transportation & Warehousing are not included because there were too few establishments or employees.  
Source: Illinois Department of Employment Security, Local Household Dynamics Dataset.

*Quadrant 1 (upper left)* contains industries that are growing and have a lower than average concentration. These sectors may provide significant opportunities because they are showing signs of strength (growth) and room for continued growth (lower than average concentration). The industries are proportionately underrepresented, especially Educational and the Professional and Technical services industries. McHenry is adjacent to Cook and DuPage Counties who have strength in both industries. As these areas expand these industries may have the opportunity to grow in the County. The Health Care and Social Assistance industry is growing throughout the region, as well as in McHenry County. Since the population is aging, there will be an increase in demand for these services.

*Quadrant 2 (upper right)* represents growing industries that have a higher than average presence in the county, such as Construction. Construction has been making a slow come-

back given the housing crisis beginning in 2008, but McHenry County, despite a declining population, has high construction activity compared to the state average. Another interesting note is the high growth in Administrative and Waste Services, which includes office administration, hiring, and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services. The industry had the highest growth of 30.9% from 2010 through 2015 and while these are not all high wage-high skill jobs they do offer great entry level positions.

*Quadrant 3 (lower left)* includes those industries that are contracting and have a low concentration. Real Estate and Rental and Leasing will likely begin to grow as Construction continues to recover. Nationally, the Information, Finance and Insurance industries lost a lot of employment with the recession, but have since been making a come-back, almost to pre-recession levels. The return has not been felt in Illinois, where most jobs in the sector are in the City of Chicago. As of May 2016, Chicago had lost employment in both Financial Activities and the Information industry by 0.1% and 1.1% respectively, while the country gained by 2.0% and 0.2% respectively. The decline in these sectors has been more severe in McHenry County.

*Quadrant 4 (lower right)* includes industries with a high presence in the county compared to the state, but are declining. There is a higher than average concentration of Manufacturing jobs, which is the largest industry in McHenry County with almost 15,000 employees. While 186 jobs were lost since 2010, the sector remains as the top employer. These jobs are often high skill and high wage jobs, which are good for the local economy. The Arts, Entertainment, and Recreation industry is on the decline, but it continues to have employment levels higher than the state average.

Given the importance of this information to program and curriculum planning and helping students connect with local employers, a more detailed look at the industries (3 digit NAICS) that have a location quotient greater than 1.5 is presented in Table 4. Manufacturing is dominating the field with several related industries that have a high presence in McHenry County.

Table 4: Industries with Location Quotients Greater than 1.5, McHenry County, Illinois

NAICS Code/Industry Description	Location Quotient	Major Sector	Employment 2015
NAICS 313 Textile mills	8.64	Manufacturing	146
NAICS 326 Plastics and rubber products manufacturing	4.45	Manufacturing	2,933
NAICS 111 Crop production	3.14	Agriculture	472
NAICS 314 Textile product mills	2.76	Manufacturing	136
NAICS 339 Miscellaneous manufacturing	2.76	Manufacturing	1,287
NAICS 237 Heavy and civil engineering construction	2.73	Construction	1,300
NAICS 238 Specialty trade contractors	1.95	Construction	4,449
NAICS 335 Electrical equipment and appliance mfg.	1.92	Manufacturing	707
NAICS 323 Printing and related support activities	1.91	Manufacturing	832
NAICS 452 General merchandise stores	1.85	Retail Trade	3,914
NAICS 327 Nonmetallic mineral product manufacturing	1.83	Manufacturing	406
NAICS 115 Agriculture and forestry support activities	1.77	Agriculture	102
NAICS 332 Fabricated metal product manufacturing	1.76	Manufacturing	2,641
NAICS 444 Building material and garden supply stores	1.75	Retail Trade	1,281
NAICS 333 Machinery manufacturing	1.67	Manufacturing	2,051
NAICS 331 Primary metal manufacturing	1.56	Manufacturing	488
NAICS 713 Amusements, gambling, and recreation	1.53	Arts, entertainment, and recreation	1,495
NAICS 441 Motor vehicle and parts dealers	1.52	Retail Trade	1,722
NAICS 334 Computer & electronic product manufacturing	1.52	Manufacturing	766
NAICS 811 Repair and maintenance	1.50	Other services, except public administration	1,365

Source: Illinois Department of Employment Security, 2016.

## What the World Needs Now: Skills, Skills, Skills

According to research by the World Economic Forum’s Global Agenda Council on the Future of Software and Society, creativity, emotional intelligence, and cognitive flexibility are the new must-have skills for the workplace, while a worker’s ability to be a good active listener, though still valued, is becoming less important relative to other skills.

For discussion

How well is your institution investing students with the “soft” skills they will need in tomorrow’s workplace? Is your institution helping students learn to be more creative, for example, and to practice emotional intelligence? Are courses, programs, and degree requirements aligned with such 21st-century skills?

Source: SCUP 2016

**Industry Projections** anticipate growth in most areas, most notably in Trade, Transportation, and Utilities adding approximately 4,600 jobs in the ten years from 2012 through 2022, and then Educational and Health Services adding another 3,500 jobs. Overall, McHenry County is expected to gain almost 22,400 new jobs across all industries within that ten-year span. Perhaps surprising, given recent trends, is the additional 1,500 jobs expected to be added to the Manufacturing industry. Durable Goods Manufacturing is the primary driver and the highest employment gains are for Machinery manufacturing (417 jobs over the ten-year period). The only losses anticipated revolve around paper production and the postal service. Otherwise, all subsectors are expected to either remaining stable or expand. See Table 5 on the following page.

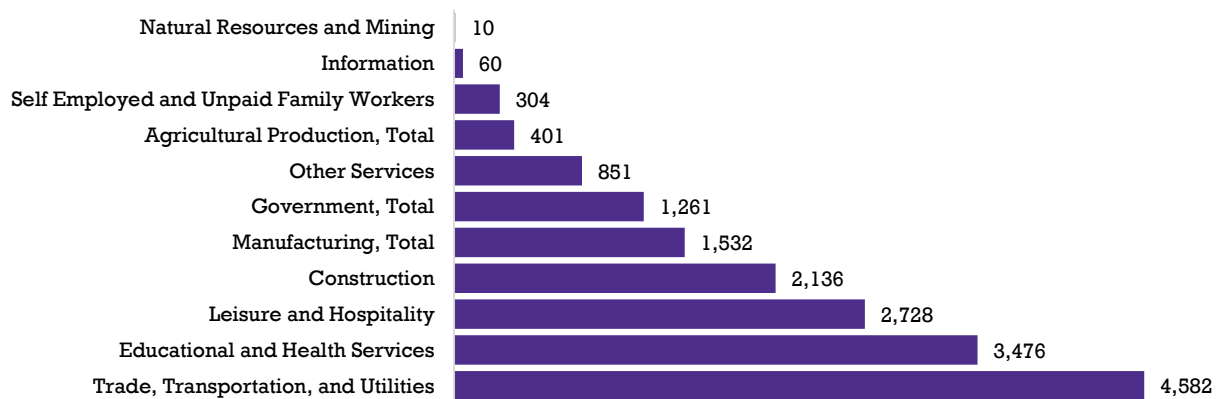
**Table 5: Industry Employment Projections, McHenry County, Illinois**

Industry Description	2012	2022	Change	Percent
<b>Total, All Industries</b>	<b>109,802</b>	<b>132,201</b>	<b>22,399</b>	<b>20.4%</b>
Self Employed and Unpaid Family Workers	9,939	10,243	304	3.1%
Agricultural Production, Total	2,004	2,405	401	20.0%
<b>Total Nonfarm</b>	<b>97,859</b>	<b>119,553</b>	<b>21,694</b>	<b>22.2%</b>
Natural Resources and Mining	62	72	10	16.1%
Construction	5,953	8,089	2,136	35.9%
Manufacturing, Total	15,409	16,941	1,532	9.9%
Non-Durable Goods Manufacturing, Total	6,641	7,022	381	5.7%
Trade, Transportation, and Utilities	20,919	25,501	4,582	21.9%
Wholesale Trade	5,415	7,093	1,678	31.0%
Retail Trade	13,204	15,792	2,588	19.6%
Transportation & Warehousing & Utilities	2,300	2,616	316	13.7%
Information	913	973	60	6.6%
Finance and Insurance, Total	2,614	3,198	584	22.3%
Real Estate and Rental and Leasing	598	793	195	32.6%
Professional, Scientific & Tech. Services	3,345	4,588	1,243	37.2%
Management of Companies and Enterprises	699	881	182	26.0%
Administrative & Waste Management Services	6,650	9,504	2,854	42.9%
Educational and Health Services	19,902	23,378	3,476	17.5%
Educational Services, Private & Public	9,857	10,658	801	8.1%
Health Care & Social Assistance	10,045	12,720	2,675	26.6%
Leisure and Hospitality	9,735	12,463	2,728	28.0%
Arts, Entertainment, and Recreation	1,768	2,062	294	16.6%
Accommodation and Food Services	7,967	10,401	2,434	30.6%
Other Services	4,440	5,291	851	19.2%
Personal & Other Services	4,440	5,291	851	19.2%
<b>Government, Total</b>	<b>6,620</b>	<b>7,881</b>	<b>1,261</b>	<b>19.0%</b>
Federal Government, exc. U.S. Post Office	83	99	16	19.3%
State Government, exc. Education & Hospitality	153	189	36	23.5%
Local Government, exc. Education & Hospitality	6,384	7,593	1,209	18.9%

Source: Illinois Department of Employment Security.

The projections are calculated by the Illinois Department of Employment Security as a general guide, but certainly external circumstances can change the course of some of these anticipated trends. However, comparing the county with what is anticipated statewide there is a stark contrast as Illinois is projected to only gain 5.9% as opposed to McHenry’s 20.4% in employment. There are still industries projected to contract such as Manufacturing throughout Illinois, some of which can be attributed to the advancement of technology. However, McHenry seems to be poised well in recovering from the recession in comparison with other areas throughout the state and the future is projected to bring rising employment in the region.

Figure 11: Summary Industry Projections in McHenry County, 2012 through 2022



Source: Illinois Department of Employment Security.

### Occupational Projections

Another lens through which employment trends may be examined is occupation. While industry sectors focus on the type of production associated with enterprises, such as manufacturing or transportation, occupational classifications focus on job responsibilities, such as janitor or manager. Occupational trends are particularly important for postsecondary institutions as they have implications for program and curriculum development and certifications.

Occupation projections developed by the Illinois Department of Employment Security include expected openings due to both growth and replacements. Growth in employment comes as

firms add production. Replacements are due to retirements or someone leaving for another occupation. Some occupations are expected to hire more employees due to growth, such as construction and health care practitioners. Many others will have more openings due to replacements, including sales, administrative, and production (see Table 6).

**Table 6: Projected Employment Growth by Occupations, McHenry County, Illinois**

Occupation Group	2012	2022	Job Growth 2012-2022			Median Salary
			New	Replacement	Total	
<b>Total, All</b>	<b>109,802</b>	<b>132,201</b>	<b>22,399</b>	<b>25,990</b>	<b>48,980</b>	<b>\$33,184</b>
Sales & Related	12,400	14,946	2,546	3,800	6,350	\$22,670
Office & Administrative Support	14,041	16,525	2,484	3,150	5,760	\$33,032
Food Preparation & Serving	8,259	10,542	2,283	3,050	5,330	\$19,228
Production	10,731	12,305	1,574	2,140	3,880	\$32,036
Transportation & Material Moving	7,594	9,456	1,862	1,850	3,710	\$32,407
Construction & Extraction	6,502	8,442	1,940	1,120	3,060	\$66,032
Management	8,789	9,742	953	1,700	2,950	\$89,130
Education, Training & Library	7,959	8,747	788	1,760	2,550	\$41,604
Healthcare Practitioners & Technical	4,825	5,968	1,143	1,000	2,140	\$56,676
Building & Grounds Cleaning & Maintenance	4,464	5,599	1,135	930	2,070	\$23,888
Installation, Maintenance & Repair	3,910	4,821	911	900	1,810	\$46,038
Business & Financial Operations	3,499	4,536	1,037	690	1,730	\$66,359
Personal Care & Service	4,003	4,823	820	910	1,730	\$21,889
Protective Service	2,524	3,085	561	740	1,300	\$40,795
Healthcare Support	2,391	3,093	702	460	1,160	\$30,215
Computer & Mathematical	1,514	2,016	502	250	750	\$81,928
Architecture & Engineering	1,350	1,658	308	320	630	\$69,834
Arts/Design/Entertainment, Sports/Media	1,551	1,756	205	370	580	\$25,199
Farming, Fishing & Forestry	1,204	1,412	208	350	560	\$24,986
Community & Social Services	1,294	1,538	244	300	540	\$35,225
Legal Services	603	717	114	100	210	\$64,356
Life, Physical & Social Science	395	474	79	110	190	\$58,874

Source: Illinois Department of Employment Security, 2014.

### Current Demand for Workers

The real-time demand for workers, as well as the required skills, credentials and other attributes can now be assessed through web-based technologies that scan millions of job and applicant postings on popular sites such as Monster, SimplyHired, and Indeed or posted by various state and local employment bureaus. Labor Insight™, developed by Burning Glass Technologies, is one such tools for measuring current demand for workers across a broad



variety of industries and occupations. While some employers do not post job listings on public job sites, it does give a sense of the types of jobs available within the McHenry County College District. A complete listing is in Appendix A.

The Certifications featured in Table 7 were found within the job ads and ranked according to the number of postings in which they appeared. Registered Nurses and other healthcare related certifications appeared most frequently. This is not surprising as the healthcare sector has exhibited substantial job growth and a number of major hospitals and clinics are located in the region. Certifications for truck drivers and couriers are also featured prominently as are credentials relative to various white collar professions such as project management and information technology.

**Table 7: Requested Certification Listed in Job Posting, McHenry County, Illinois (Q2 2016)**

<b>Certifications</b>	<b>Total Citations</b>
CDL Class A	290
Registered Nurse	120
First Aid CPR AED	78
Commercial Driver's License	48
Certified Public Accountant (CPA)	31
Automotive Service Excellence (ASE) Certification	25
Forklift Operator Certification	23
American Speech - Language Hearing Association	22
Certified Nursing Assistant	22
Real Estate Certification	21
Certified A+ Technician	17
Certified Occupational Therapy Assistant (COTA)	14
Advanced Cardiac Life Support (ACLS) Certification	13
Security Guard Certification	13
Project Management Certification (E.G. PMP)	12
Certified Medical Assistant	11
Critical Care Registered Nurse (CCRN)	10
Mortgage License	10

Source: Labor Insight™, Burning Glass Technologies, 2016.

The top occupations shown in Table 8 clearly comport to the most popular job certifications (Table 7). In addition to being indicative of regional demand, the postings for Truck Drivers, Registered Nurses and other healthcare professionals also reflects a strong nationwide demand as well as competition for individuals with the requisite skills and certifications. This

represents a significant opportunity for community colleges as many of these jobs require certifications or degrees that are already being offered by these institutions. This is also true of many of the other white-collar professional and service occupations, such as Customer Service Representatives, Administrative Assistants, and various IT, financial and Human Resources Specialists.

**Table 8: Top Occupations by Number of Job Postings, McHenry County, Illinois (Q2 2016)**

<b>Occupation Title/SOC Code</b>	<b>Job Postings</b>
Heavy and Tractor-Trailer Truck Drivers (53-3032)	481
Retail Salespersons (41-2031)	207
Registered Nurses (29-1141)	148
First-Line Supervisors of Retail Sales Workers (41-1011)	110
Customer Service Representatives (43-4051)	107
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products (41-4012)	89
Speech-Language Pathologists (29-1127)	76
Combined Food Preparation and Serving Workers, Including Fast Food (35-3021)	68
First-Line Supervisors of Food Preparation and Serving Workers (35-1012)	58
Production Workers, All Other (51-9199)	51
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	46
Managers, All Other (11-9199)	46
Maintenance and Repair Workers, General (49-9071)	45
Merchandise Displayers and Window Trimmers (27-1026)	41
Occupational Therapists (29-1122)	40
Physical Therapists (29-1123)	40
Security Guards (33-9032)	40
Accountants and Auditors (13-2011)	38
Preschool Teachers, Except Special Education (25-2011)	38
Stock Clerks and Order Fillers (43-5081)	37

Source: Labor Insight™, Burning Glass Technologies, 2016.

The industry breakdown of job postings closely reflects those that have the greatest presence and the highest employment growth in the region (Table 9). These include healthcare, education, transportation, and business and professional services. Other important sectors include retailing, restaurants, hospitality and recreation and leisure services. It is also interesting to note that the insurance carriers also ranked near the top of the list for the number of job openings. Since this sector experienced considerable job losses during the last recession and have struggled since then, the surge in job postings may be a sign that a turnaround is underway.

**Table 9: Top Industries by Number of Job Postings, McHenry County, Illinois (Q2 2016)**

Industry	Job Postings
General Freight Trucking (4841)	272
Restaurants and Other Eating Places (7225)	138
Elementary and Secondary Schools (6111)	110
Insurance Carriers (5241)	104
Offices of Other Health Practitioners (6213)	75
Depository Credit Intermediation (5221)	69
Management, Scientific, and Technical Consulting Services (5416)	61
Business Support Services (5614)	58
Department Stores (4521)	54
General Medical and Surgical Hospitals (6221)	53
Specialized Freight Trucking (4842)	50
Building Material and Supplies Dealers (4441)	49
Investigation and Security Services (5616)	48
Navigational, Measuring, Electro-medical, and Control Instruments Manufacturing (3345)	39
Automotive Parts, Accessories, and Tire Stores (4413)	38
Child Day Care Services (6244)	36
Office Supplies, Stationery, and Gift Stores (4532)	32
Other Amusement and Recreation Industries (7139)	31
Colleges, Universities, and Professional Schools (6113)	30
Sporting Goods, Hobby, and Musical Instrument Stores (4511)	30

Source: Labor Insight™, Burning Glass Technologies, 2016.

**Table 10: Top Skills by Number of Job Openings, McHenry County, Illinois (Q2 2016)**

Skills Listed on at Least 50 Job Postings	Citations
Communication Skills	748
Customer Service	505
Writing	462
Physical Demand	401
Organizational Skills	399
Computer Skills	335
Microsoft Excel	291
Problem Solving	280
Detail-Oriented	268
Supervisory Skills	253
English	234
Team Work/ Collaboration	218
Microsoft Office	212
Planning	184
Building Effective Relationships	176
Troubleshooting	157
Mathematics	150
Multi-Tasking	139
Time Management	129
Microsoft Word	125
Listening	122
Quality Assurance and Control	120
Creativity	115
Research	110
Bilingual	87
Project Management	87
Energetic	85
Leadership	80
Analytical Skills	75
Telephone Skills	75
Preventive Maintenance	73
Microsoft Powerpoint	69
Work Area Maintenance	68
Spanish	66
Meeting Deadlines	64
Typing	63
Self-Starter	58

Source: Labor Insight™, Burning Glass Technologies, 2016.

When analyzing the top skills requested by employers, duplication is evident as most job ads list multiple skill-sets (Tables 10 and 11). It gives a sense of the kinds of skills that employers are seeking in new employees, although it is difficult to assess how and to what degree employers evaluate these skills (i.e. are they based on the applicant’s on-the-job experience, credentials obtained, or pre-employment testing). However, it is clear that “soft-skills” or “people skills” such as customer service or contact, sales and relationship building are highly valued for a wide range of jobs. These skills are more value-oriented, but educational programs could help to instill values such as ethics and professionalism when dealing with others. Furthermore, some aspects of customer service or sales also involve the use of more technology (i.e. social media marketing), so community colleges can capture additional students by offering more credentialed courses for this sector.

Table 11: Top Specialized Skills by Number of Job Openings, McHenry County, Illinois (Q2 2016)

Skill	Listings	Skill	Listings
Customer Service	505	Loss Prevention	92
Sales	504	Cardiopulmonary Resuscitation (CPR)	91
Retail Setting	313	Accounting	89
Scheduling	277	Project Management	87
Supervisory Skills	253	Data Entry	78
Merchandising	209	Forklift Operation	78
Customer Contact	205	Patient Care	74
Store Management	200	Cash Handling	71
Inspection	198	Scanners	67
Repair	197	Sales Management	65
Budgeting	176	Business Development	63
Cleaning	168	Spreadsheets	63
Product Sales	153	Cooking	62
Mathematics	150	Machinery	58
Labeling	126	Treatment Planning	58
Description & Demo of Products	125	Current Good Manufacturing Practices (CGMP)	57
Listening	122	Technical Support	57
Product Knowledge	119	Validation	57
Teaching	119	Product Development	55
Sales Goals	114	Food Safety	53
Retail Sales	107	SAP	53
Packaging	104	Store Operations	52
Staff Management	96	Customer Billing	50

Source: Labor Insight™, Burning Glass Technologies, 2016.

### Commuting and Workforce Mobility

Worker commuting patterns can be indicators of the true size and scope of the regional labor markets, and in metropolitan environments they can indicate the degree of economic interdependency with the surrounding region. An area’s ability to pursue economic development depends in part on the supply and mobility of workers. Matching local talent with local jobs is not easily done in a labor market as large, mobile, and diverse as the Chicago metropolitan area. The larger communities within the McHenry County (Algonquin, Crystal Lake, Harvard, McHenry, and Woodstock) are major regional business centers, employing significantly more workers than live within the District. At the same time, many District residents commute to jobs in the surrounding metropolitan area. Although this situation presents workers and employers tremendous opportunities for employment, as well as talent acquisition, it also creates considerable challenges for educational institutions in determining the types training or degree programs to offer. Nevertheless, understanding

overall trends in workers commuting patterns, location of regional centers of business activity and the projected employment demand for key industries and occupations provide important insights into how the community college system can best position itself to serve the needs of future students and the business community.

Commuting patterns are best described as worker outflow (employed residents in a specified area that work outside the area) and worker inflow (workers living in other areas but employed in a specified area). The regional labor force consists of those who live in the McHenry County College District but are employed in the surrounding areas, those who are employed in the District but live elsewhere, and those who both live and work in the District. Labor market data for the District indicates a substantial and growing number of workers commute to jobs outside the District to jobs in the nearby region. In 2014, 129,330 workers lived in the McHenry County College District, compared with employment of 78,799 within the District, resulting in a net outflow of 50,531 workers to jobs in the surrounding areas (Table 12). This net outflow of workers has increased 26.6% since 2002 even as employment and the number of workers living in the District have continued to grow, albeit at a much slower pace. Between 2002 and 2014, those employed in the District increased by 2.15%. The data also shows the lingering impact of the last recession as employment has yet to surpass its 2008 peak of 85,366 and has been essentially flat since 2010. Meanwhile, the number of employed residents (that may work inside or outside the District) has grown by a more robust 10.5%.

Table 12: Commuter Inflow/Outflow, McHenry County College District, 2002 – 2014

Primary Jobs	2014		2010		2006		2002	
	Count	Share	Count	Share	Count	Share	Count	Share
Employed in the District	78,799	100.0%	78,719	100.0%	84,527	100.0%	77,135	100.0%
Living in the District	129,330	164.1%	123,483	156.9%	126,021	149.1%	117,038	151.7%
Net Job Inflow (+) or Outflow (-)	-50,531	-	-44,764	-	-41,494	-	-39,903	-

Source: U.S. Census Bureau, Local Employment Dynamics, 2016.

An examination of the educational attainment characteristics of District residents that are employed reveal some concerning trends but also reveal several opportunities for higher education institutions. Although those with less than a high school education represented 7.0% of workers, their numbers have increased by 28.8% between 2010 and 2014. At the same time, high school graduates and those with some college or and Associate level degree grew by 10.9% and 2.4%, respectively. Resident workers with a Bachelor's degree or an advanced degree declined by 0.5% (Table 13).

**Table 13: Education Attainment of Workers Living in the McHenry County College District, 2010 – 2014**

Jobs by Worker Educational Attainment*	2014		2014	2010		2010	Change	
	Count	Share	Illinois Share	Count	Share	Illinois Share	2010-2014 Count	2010-2014 Share
<b>Less than high school</b>	9,103	7.0%	9.1%	7,066	5.7%	8.1%	2,037	28.8%
<b>High school or equivalent, no college</b>	25,037	19.4%	20.3%	22,582	18.3%	19.6%	2,455	10.9%
<b>Some college or Associate degree</b>	32,856	25.4%	24.4%	32,093	26.0%	24.1%	763	2.4%
<b>Bachelor's degree or advanced degree</b>	36,316	28.1%	24.5%	36,481	29.5%	25.3%	-165	-0.5%

\*Some included in these counts did not provide their education information and so totals do not match Table 12. Source: U.S. Census Bureau, Local Employment Dynamics, Home Area Profile, 2015.

At the same time, those employed within the District (regardless of whether live inside or outside the District) show similar educational characteristics (Table 14). Although those without a high school diplomas or GEDs makeup a slightly higher proportion of employment, the numbers are considerably smaller which reflects the smaller job market within the McHenry County College District. The same is true for high school graduates without any post-high school training or education.

**Table 14: Education Attainment of Workers Employed in the McHenry County College District, 2010 – 2014**

Jobs by Worker Educational Attainment	2014		2014	2010		2010	Change	
	Count	Share	Illinois Share	Count	Share	Illinois Share	2010-2014 Count	2010-2014 Share
<b>Less than high school</b>	6,778	8.6%	9.1%	6,387	8.1%	8.1%	391	6.1%
<b>High school or equivalent, no college</b>	16,302	20.7%	20.3%	15,721	20.0%	19.6%	581	3.7%
<b>Some college or Associate degree</b>	20,283	25.7%	24.4%	20,285	25.8%	24.1%	-2	0.0%
<b>Bachelor's degree or advanced degree</b>	18,631	23.6%	24.7%	19,324	24.5%	25.5%	-693	-3.6%

\*Some included in these counts did not provide their education information and so totals do not match Table 12. Source: U.S. Census Bureau, Local Employment Dynamics, Home Area Profile, 2015.

While the impact on employers may be ameliorated by the size and diversity of the surrounding labor market, it presents an opportunity for McHenry County College to expand and promote its adult education and GED program as this data clearly suggests a need. The growth in the number of high school graduates also indicates a growing market for the College’s degree and certificate programs.

The region’s transportation network permits for easy access for McHenry County residents to a variety of employment opportunities around the greater Chicago area while allowing them to live a more affordable suburban or rural lifestyle. Since Chicago is the primary employment center in the region, it is not surprising the greatest share of outbound commuters head into the City (Table 15). The number of workers commuting to Chicago has grown substantially in recent years, increasing by 27.4% between 2002 and 2014. While five of the top 10 work destinations are within McHenry County or in nearby communities in Cook or Kane counties, number of commuter to many of these areas has been static or declined over the same period. The reasons for this are unclear, but it may be an indication that the effects of the last recession are still lingering for many of the employers in these communities. There is also the recent trend of corporate relocations from the suburbs back to the City of Chicago which may account for some of the shift on commuting patterns.

**Table 15: Where McHenry County College District Residents are Employed, 2002 – 2014**

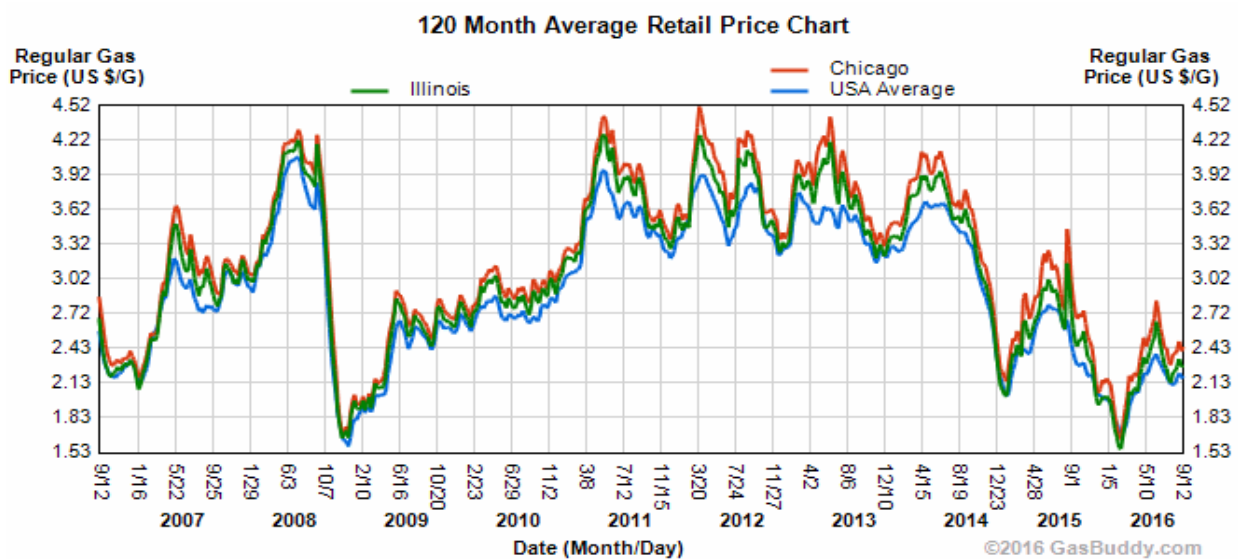
Top Work Destinations	2014		2010		2006		2002	
	Count	Share	Count	Share	Count	Share	Count	Share
<b>Chicago city, IL</b>	10,912	8.4%	10,417	8.4%	8,764	7.0%	8,563	7.3%
<b>Crystal Lake city, IL</b>	9,675	7.5%	9,877	8.0%	11,149	8.8%	11,491	9.8%
<b>McHenry city, IL</b>	7,794	6.0%	7,865	6.4%	8,234	6.5%	7,280	6.2%
<b>Woodstock city, IL</b>	6,406	5.0%	7,074	5.7%	7,887	6.3%	7,218	6.2%
<b>Elgin city, IL</b>	4,787	3.7%	4,395	3.6%	4,469	3.5%	3,810	3.3%
<b>Schaumburg village, IL</b>	4,013	3.1%	3,668	3.0%	4,271	3.4%	4,004	3.4%
<b>Cary village, IL</b>	2,653	2.1%	2,918	2.4%	2,948	2.3%	2,707	2.3%
<b>Huntley village, IL</b>	2,388	1.8%	2,558	2.1%	2,528	2.0%	1,756	1.5%
<b>Hoffman Estates village, IL</b>	1,763	1.4%	2,008	1.6%	2,405	1.9%	1,970	1.7%
<b>Algonquin village, IL</b>	1,742	1.3%	1,443	1.2%	1,501	1.2%	1,257	1.1%
<b>All Other Locations</b>	77,197	59.7%	71,260	57.7%	71,865	57.0%	66,982	57.2%

Source: U.S. Census Bureau, Local Employment Dynamics, 2016.



The price of gasoline figures into the distance workers or those going to higher education institutions, are willing to endure. Luckily, since the spike in 2011, gas prices on average have declined considerably. The high in March 2011 in Chicago has reached a multi-year low recently in March 2015. The trends have been consistent throughout Illinois and the nation. If prices remain stable the affordability to commute will remain higher than what was experienced since the recession.

Figure 12: U.S., Illinois, and Chicago Metropolitan Area Gas Prices



## PAY AFTER YOU GO

Under a groundbreaking new program, Purdue University will enable students to receive money for college with the condition that they pay it back after they graduate and get a job. Under the Income Share Agreement (ISA), students agree to pay a percentage of their income post-graduation over a defined number of years. Purdue says the option is not a loan and will cost students less than a conventional with-interest student loan.

For discussion: As the cost of college continues to rise and more students from low-income households seek to enroll, we can expect to see more creative solutions for paying for college like Purdue's ISA. Would your institution be open to such out-of-the-box ideas? What other new strategies might your institution adopt to keep college affordable and accessible?

Source: SCUP 2016.

## SECTION 4: COMMUNITY - Building a Community of Learners

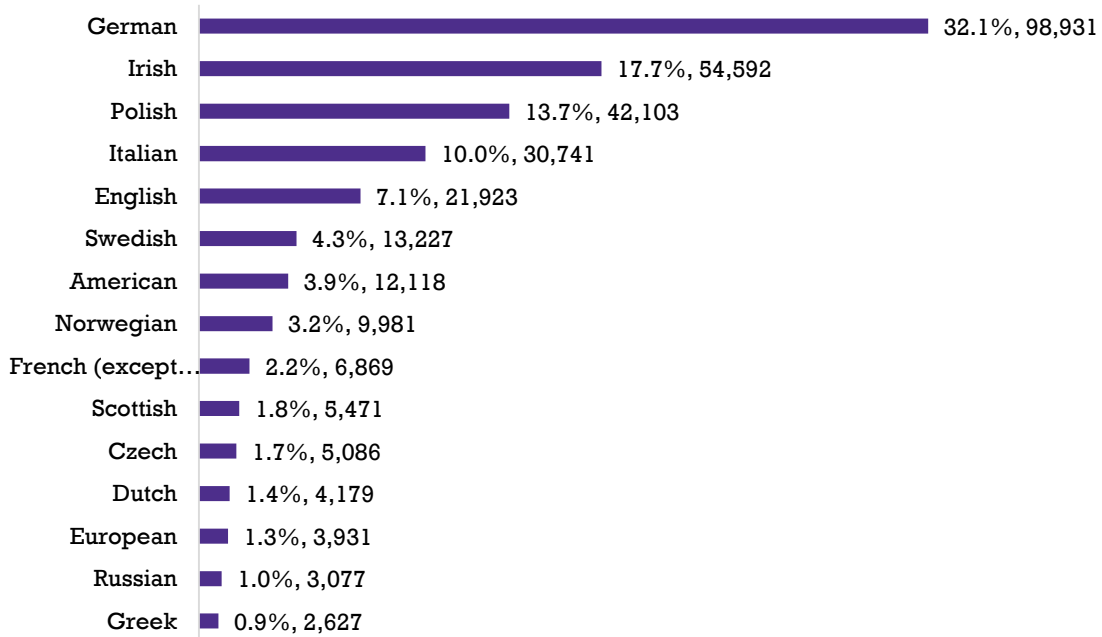
MCC is committed to building a community of learners whose learning takes place within and outside of the MCC campus. To do this will require that all MCC students, faculty, and administrators embrace the range of learning needs and aspirations that are brought to such an enterprise, and to celebrate diverse backgrounds, heritages, and experiences. It will also require preparing each learner to participate fully in available learning opportunities.

### Ancestry

Large cities tend to draw in foreign populations from around the world. Having Chicago in such proximity to McHenry County leads to a widely diverse resident population.

Figure 13 illustrates citizens' national ancestry, including duplications as couples marry and have children with mixed ancestries. The most commonly reported was German descent. Not surprising since German immigrants and remnants of that original settlement is still found in restaurants and landmarks throughout the county. The top 15 ancestries are listed. Any reported ancestries beyond that drop off considerably in numbers.

Figure 13: 2014 McHenry County Ancestry



Source: U.S. Census Bureau, American Community Survey 2014.

**Immigration** is a hot topic in the news. However, there are immigrants here for a variety of reasons such as attending school, taking care of business, or to work. There will always be immigrants in this country. The data in Table 16 represent the immigrants that are estimated to be in McHenry County. The numbers are stable from 2010 through 2015 except for the switch of an increased number and proportion of those seeking naturalization and the decline in numbers and proportion of those that are not a U.S. citizen. Nationally the trend is similar in that more non-citizens are seeking naturalization.

Citizenship Status	2010	2010 %	2014	2014 %
McHenry County Residents	306,050	100.0%	307,357	100.0%
U.S. citizen, born in the United States	274,165	89.5%	275,257	89.5%
U.S. citizen, born in Puerto Rico or U.S. Island Areas	384	0.3%	355	0.2%
U.S. citizen, born abroad of American parent(s)	1,654	0.8%	1,914	0.6%
U.S. citizen by naturalization	13,191	4.3%	14,996	5.1%
Not a U.S. citizen	16,656	5.2%	14,835	4.7%

Source: U.S. Census Bureau, American Community Survey, Five Year Estimates

**Foreign born** residents are not as attracted to McHenry County as the more densely populated counties in the region. The Chicago MSA, which includes counties in Wisconsin and Indiana, attracts a higher proportion of immigrants that are both naturalized to become a citizen and those who have not. Being foreign born and not a U.S. citizen does not mean illegal as most these people are visiting on school, work, or tourist visas.

Nativity Status	Illinois	Chicago MSA	McHenry County
<b>Native population</b>	86.1%	82.0%	90.5% (278,576 people)
<b>Foreign Born and Naturalized citizens</b>	6.5%	8.9%	4.6% (14,219 people)
<b>Foreign Born and Not a U.S. citizen</b>	7.4%	9.1%	4.9% (15,093 people)

Source: U.S. Census Bureau, American Community Survey 2014.

## Race and Ethnicity

The State of Illinois is experiencing population loss throughout the state except for a small number of counties. Most of those moving out are white and of working age and not Hispanic. McHenry is experiencing a similar trend of population loss, albeit small in comparison to other counties. As can be seen in Table 18 the non-Hispanic white population declined by almost 10,000 between 2009 and 2014. The second largest loss is the classification of being of some other race other than the four major categories shown, and they are of Hispanic ethnicity. Significant gains have occurred in the Hispanic population, but not enough to offset the loss of white residents. Overall, McHenry has a net loss of just over 5,000 residents, or 1.6%, since 2009.

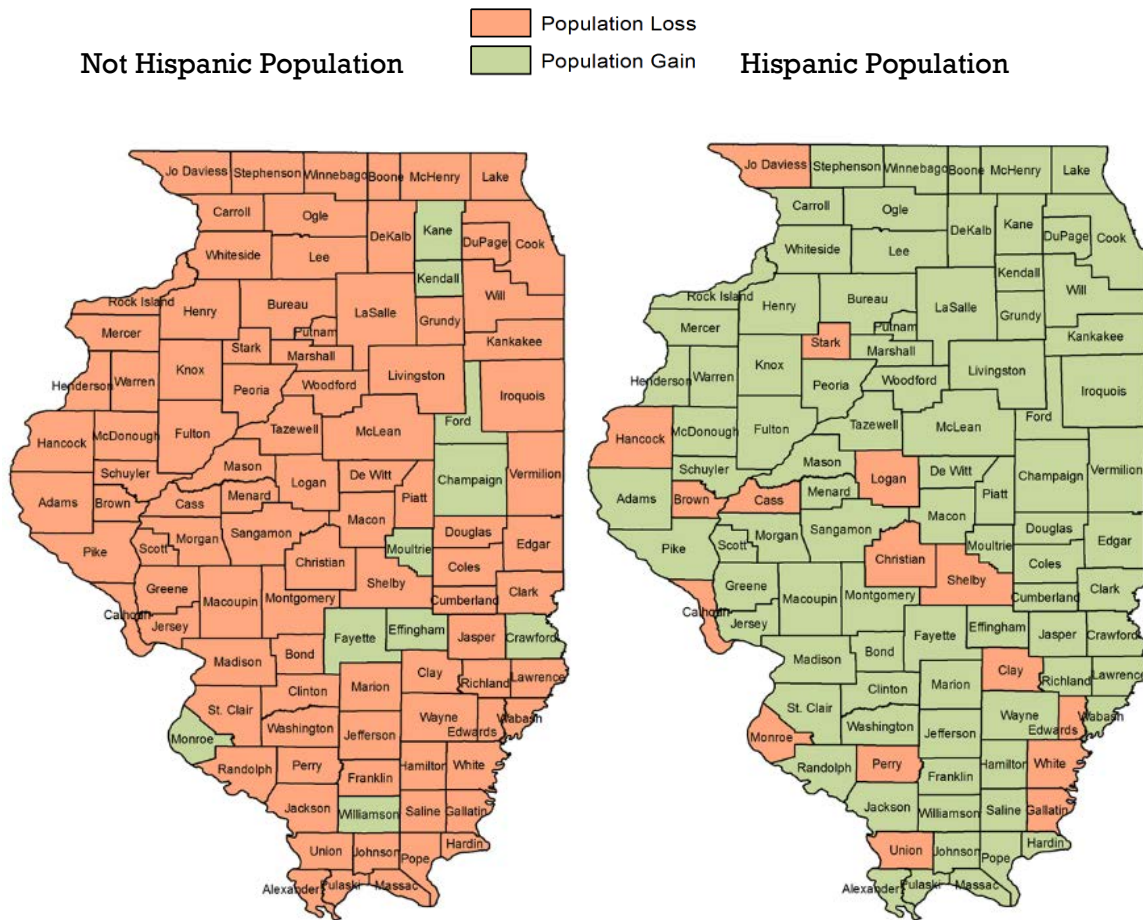
	2009	2014	Change	Percent
Total Population	312,946	307,888	-5,058	-1.6%
Not Hispanic or Latino	279,737	271,265	-8,472	-3.0%
White	265,197	255,364	-9,833	-3.7%
Black or African American	2,874	3,563	689	24.0%
American Indian and Alaska Native	268	158	-110	-41.0%
Asian	8,145	7,854	-291	-3.6%
Some other race	328	392	64	18.9%
Two or more races	2,925	3,934	1,009	34.5%
Hispanic or Latino*	33,209	36,623	3,414	10.3%
White	19,198	24,792	5,594	29.1%
Black or African American	94	254	160	170.2%
American Indian and Alaska Native	84	326	242	288.1%
Asian	177	126	-51	-28.8%
Some other race	11,953	9,765	-2,188	-18.5%
Two or more races	1,703	1,360	-343	-20.1%

Source: U.S. Census Bureau, American Community Survey 5 Year, 2009 & 2014.

\*Hispanics and Latinos can be of any race.

The following statewide maps show the stark contrast between the change in population of non-Hispanics and Hispanics. The trend has been consistent for the last several years. The population of non-Hispanic (primarily white) has declined across the state. The Hispanic population has been increasing at almost the same pace making the overall net change negligible statewide (see Figure 14).

Figure 14: Change in Population 2014-2015



Source: U.S. Census Bureau, American Community Survey, Five Year Data

This rapid increase in Latino residents represents an important market for MCC. McHenry County has the tenth largest proportion of Hispanic or Latino residents. It is anticipated this number will continue to grow in numbers and proportion.

**Table 19: Illinois Counties by Percentage of Latino Residents**

County Name	Total Population	Latino Population	Percent Latinos
Kane	521,874	162,048	31.1%
Cook	5,227,827	1,281,217	24.5%
Lake	703,170	143,841	20.5%
Boone	54,005	10,943	20.3%
Cass	13,440	2,432	18.1%
Kendall	118,194	19,155	16.2%
Will	682,108	109,841	16.1%
DuPage	926,485	127,142	13.7%
Rock Island	146,964	17,686	12.0%
McHenry	307,888	36,623	11.9%

Source: US Census Bureau, American Community Survey, 2014 5 Year, Table B03003.

In addition to general barriers to postsecondary education, such as the decreasing availability of grants and loans to help pay for college and inconvenient public transportation, Latinos may be confronting additional obstacles such as language and cultural barriers and legal status. These may be addressed in part by the Obama administration’s amnesty program for those under the age of 30. Once these individuals file their paperwork through the courts in 2013, they will be eligible for student loans to attend schools of their choice. Further, in January 2013, Illinois authorized the passage of driver’s licenses for undocumented residents. This means that public transportation will no longer be a necessity for travel. These two developments have the potential to expand access to higher education by Latino residents in McHenry County. However, the recent presidential election adds considerable uncertainty for these policies.

**Diversity, Multiculturalism, and Inclusiveness**

The face of McHenry County is changing similar to the majority of counties in Illinois. The cultural identity of residents will become more diverse and complex. Planning to incorporate the importance of acceptance and promotion of diversity will be critical on campus. Providing a supportive atmosphere that encompasses the changing nature of the population can lead to expanding demographics of the student body. The message comes from the administration. MCC already supports a variety of student organizations that span religious, ethnic, and sexual orientation groups. A summary of student associations by area community colleges is presented in Table 20, and Appendix B contains a full listing of student association types in peer community colleges. Although the number of such organizations does not necessarily correlate to need or quality, it does signal to prospective students the importance that an institution places on diversity, multiculturalism, and inclusion.

**Table 20: Number of 2016 Student Associations**

McHenry	Lake County	Elgin	Harper	Joliet	Kishwaukee	Rock Valley	Prairie	Oakton
34	40	20	69	16	29	43	24	30

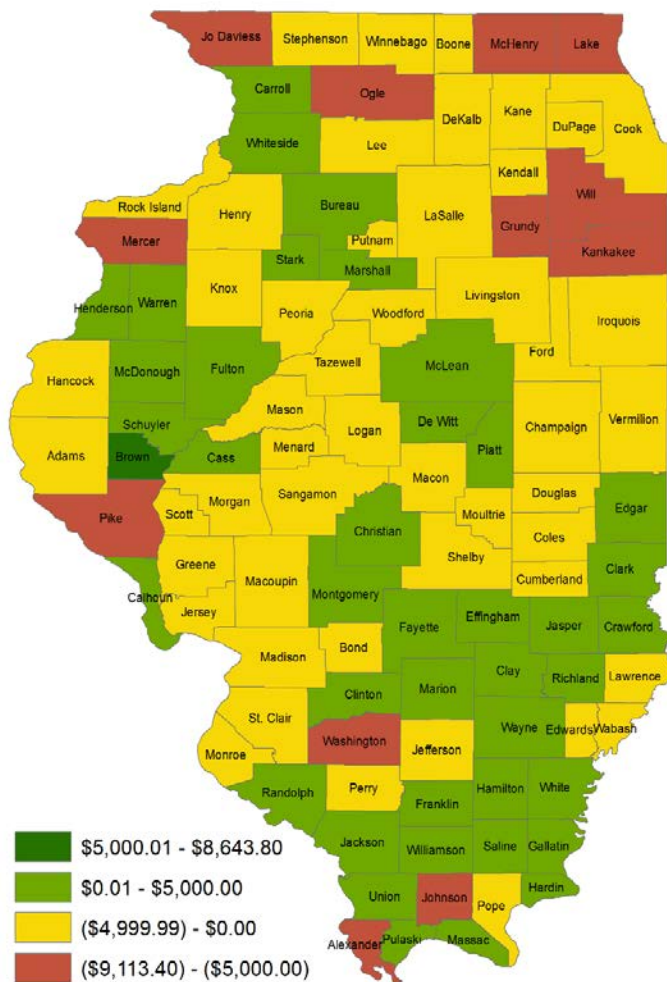
There has been an increase in the number of student associations offered at each peer institutions in the last three years. These emphases are vital if a community college is to be a successful bridge for students stepping out from their local communities into the global economy. America's workforce is more diverse than at any time in the nation's history, and a growing percentage of the working-age population is from a wider variety of minority groups. Successful performance in today's rapidly multicultural workforce requires sensitivity to human differences and the ability to relate to people from varied cultural backgrounds. Thus, an increasingly important postsecondary educational outcome is helping students become more comfortable and competent in moving personally and professionally among cultures of the world. A related outcome is to prepare students to engage in worldwide activities related to education, business, and social interaction.

To achieve these goals, community colleges are engaged in a wide range of efforts to internationalize the learning experience. They are incorporating international components

into new and existing curricula, providing special programs, activities, and classes for their growing immigrant and foreign student populations, initiating study abroad programs, encouraging faculty exchanges, and recruiting international students to the campus.

### Median Household Income and Financial Need

Figure 15: Median Household Adjusted Income Change, 2009-2014



Source: U.S. Census Bureau, American Community Survey 2014.

The map shown as Figure 15 shows the pattern of county level change in inflation adjusted median household income between 2009 and 2014. The median household income is a gauge for how incomes have kept up with inflation. Since the recession, the inflation rate has remained low. However, the recovery of incomes has had mixed results throughout the state. McHenry County has the second highest decline in buying power, the highest loss being in Johnson County of \$9,113. McHenry County lost \$8,700, shifting the median income level from an inflation adjusted income of \$85,045 in 2009 to the 2014 median income of \$76,345.

While the McHenry County median household income is higher than the statewide median, incomes vary significantly throughout the county. City level median incomes range from a low of \$42,386 in Harvard up to \$127,764 in Lakewood (Table 21). In addition to having the highest



income, Lakewood also enjoyed the greatest increase in median income between 2009 and 2014. Lake Barrington experienced the largest median income decline. A few communities (Harvard, McCollum Lake, and Hebron) had median incomes below the sustainable ‘living wage’ level of \$53,227 calculated by the Massachusetts Institute of Technology as needed for two adults and two children.<sup>11</sup>

**Table 21: Median Household Income Trends within McHenry County, Illinois**

Area Name	2009	2009 Adj.	2014	Change
Lakewood village, Illinois	\$110,000	\$121,000	\$127,764	\$6,764
Huntley village, Illinois	\$68,082	\$74,890	\$75,792	\$902
Cary village, Illinois	\$94,602	\$104,062	\$104,343	\$281
Crystal Lake city, Illinois	\$73,370	\$80,707	\$80,136	-\$571
Algonquin village, Illinois	\$93,666	\$103,033	\$100,534	-\$2,499
Illinois	\$55,222	\$60,744	\$57,166	-\$3,578
Gilberts village, Illinois	\$102,062	\$112,268	\$108,352	-\$3,916
Woodstock city, Illinois	\$56,491	\$62,140	\$57,583	-\$4,557
Spring Grove village, Illinois	\$98,288	\$108,117	\$103,423	-\$4,694
Lake in the Hills village, Illinois	\$80,460	\$88,506	\$83,149	-\$5,357
Wonder Lake village, Illinois	\$74,297	\$81,727	\$75,556	-\$6,171
Oakwood Hills village, Illinois	\$81,250	\$89,375	\$82,333	-\$7,042
Harvard city, Illinois	\$45,369	\$49,906	\$42,386	-\$7,520
Johnsburg village, Illinois	\$86,360	\$94,996	\$86,797	-\$8,199
McHenry County, Illinois	\$77,314	\$85,045	\$76,345	-\$8,700
Hebron village, Illinois	\$48,966	\$53,863	\$44,643	-\$9,220
Marengo city, Illinois	\$62,210	\$68,431	\$57,612	-\$10,819
Fox Lake village, Illinois	\$59,221	\$65,143	\$54,013	-\$11,130
McCullom Lake village, Illinois	\$56,238	\$61,862	\$49,444	-\$12,418
McHenry city, Illinois	\$69,098	\$76,008	\$62,580	-\$13,428
Island Lake village, Illinois	\$72,021	\$79,223	\$64,583	-\$14,640
Fox River Grove village, Illinois	\$92,850	\$102,135	\$86,364	-\$15,771
Lakemoor village, Illinois	\$80,958	\$89,054	\$71,489	-\$17,565
Lake Barrington village, Illinois	\$103,875	\$114,263	\$88,843	-\$25,420

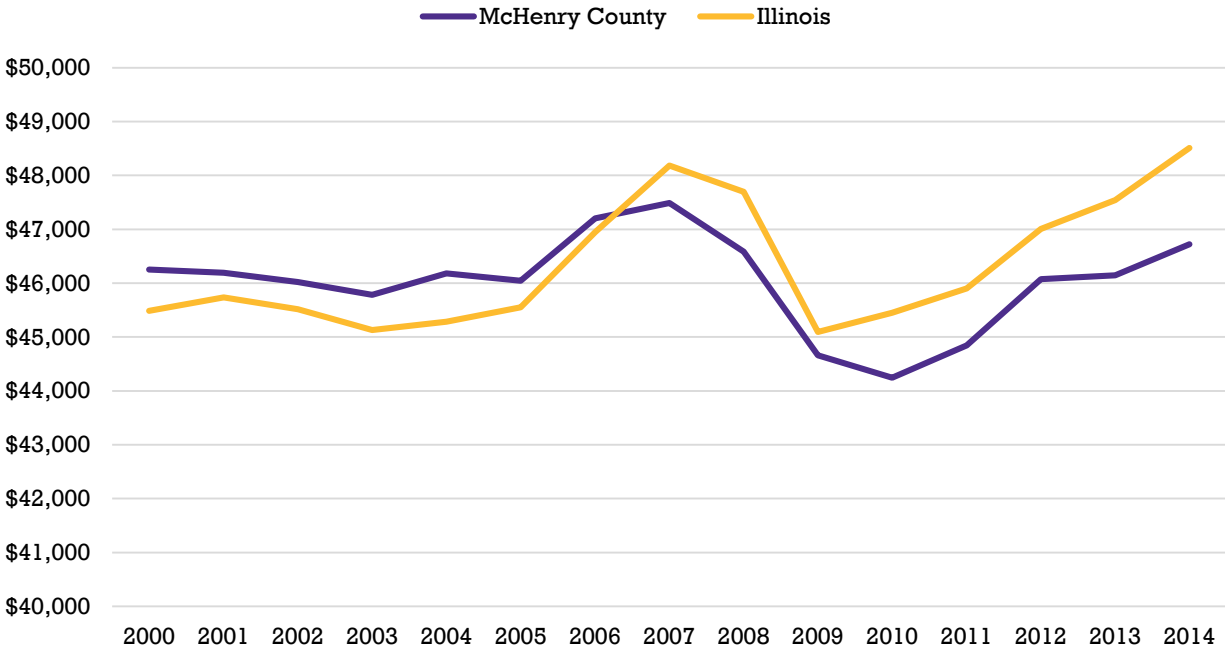
Source: U.S. Census Bureau, American Community Survey, 2009 & 2014 Five Year.

<sup>11</sup> Glasmeier, A.K. (2012). Poverty in America Living Wage Calculator. Massachusetts Institute of Technology. <http://livingwage.mit.edu/>.

### Per Capita Income

Another measure of the wealth and prosperity of a community is per capita income. This statistic divides the total wages earned by a population by the total population. McHenry County's per capita income, after adjusting into 2014 dollars, increased by 1% or \$469 from 2000 to 2014, punctuated by a drop during the 2008-2009 recession (see Figure 16). In comparison, Illinois per capita income increased \$3,021, or 6.6%.

Figure 16: McHenry County Per Capita Income (in 2014 dollars)

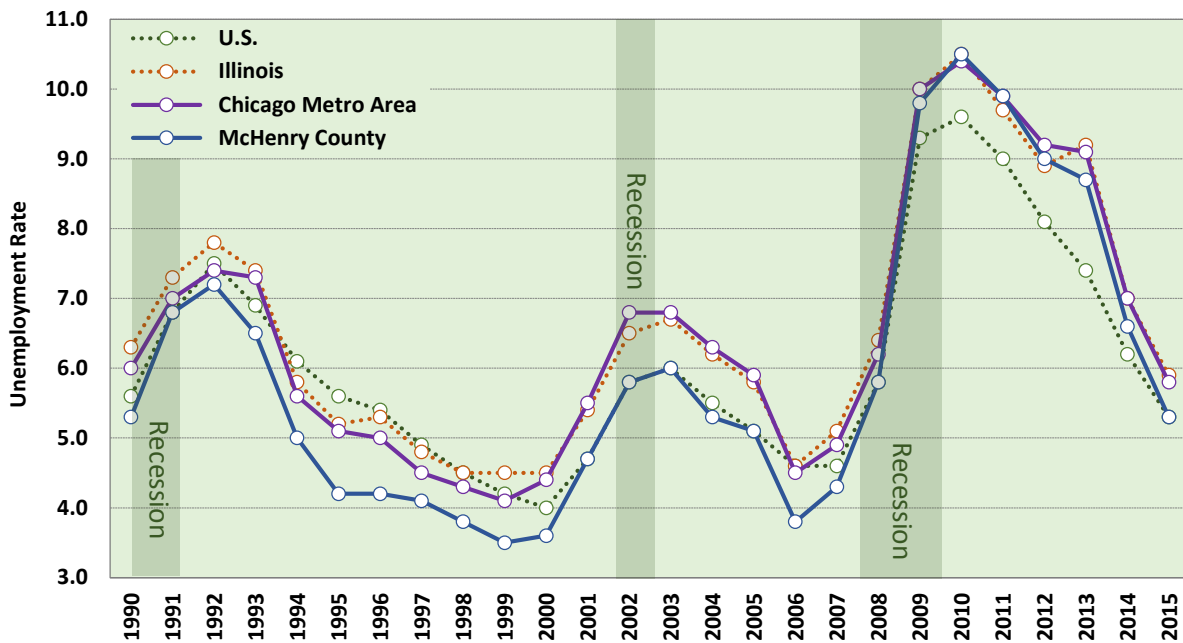


Source: Bureau of Economic Analysis.

## Unemployment

Although unemployment in Cook County and the surrounding metro area continued to fall back toward pre-recession levels, it remains significantly higher than the U.S. average (Figure 17)<sup>12</sup>. The unemployment rate in McHenry County, peaked in 2010 at 10.5% and has since fallen. In 2015, it reached 5.3% which is slightly below its pre-recession average (2003–2007).

Figure 17: Unemployment Rate Comparison (1990-2015)



Source: U.S. Bureau of Labor Statistics, 2016.

The region’s slow recovery is due in part to continuing job losses in manufacturing, financial and information services. Other key sectors such as construction and wholesale and retail trade are increasing employment, but have yet to return to pre-recession levels. Business and professional services, the largest single industry sector in the Chicago metro area, has been the primary driver of growth, adding 161,200 jobs since the end of the last recession<sup>13</sup>.

<sup>12</sup> The unemployment rate is based upon who is actively seeking work in the last week when surveyed. If a potential worker is not currently employed and not actively seeking employment, then they are not considered to be in the labor force.

<sup>13</sup> Refers to employment change from June, 2009 through September, 2016. Data source: Illinois Department of Employment Security, Labor Market Information Unit, 2016.

The education and health services and the leisure and hospitality services sectors added 84,700 and 63,300 jobs, respectively, in the last seven years. These sectors are also notable as were the only ones to have experienced employment growth both during and after the recession (Table 22). The financial activities are an area of concern as Chicago also has been a center for banking, commodity and securities trading and related services. This sector not only suffered considerable employment losses, but has also continued to lose jobs since the recession ended in June 2009.

**Table 22: Change in Industry Employment through Recent Business Cycles**

Chicago-Naperville, IL-IN-WI CSA	During Recession		Post-Recession	
	December 2007 - June 2009		June 2009 - September 2016	
	Employment Change	Percent	Employment Change	Percent
<b>Total Non-Farm Employment</b>	-276,900	-6.0	347,800	8.0
<b>Mining and Logging</b>	-300	-16.7	-300	-16.7
<b>Construction</b>	-40,000	-19.0	11,200	7.1
<b>Manufacturing</b>	-67,600	-14.0	-6,100	-1.5
<b>Wholesale Trade</b>	-19,600	-7.7	12,700	5.4
<b>Retail Trade</b>	-57,800	-11.5	20,700	4.7
<b>Transportation and Utilities</b>	-18,900	-9.0	31,500	16.5
<b>Information</b>	-7,300	-8.0	-3,300	-3.9
<b>Financial Activities</b>	-24,100	-7.4	-10,900	-3.6
<b>Professional and Business Services</b>	-75,700	-10.1	161,200	23.8
<b>Educational and Health Services</b>	15,600	2.6	84,700	13.7
<b>Leisure and Hospitality</b>	12,400	3.1	63,300	15.2
<b>Other Services</b>	-1,000	-0.5	0	0.0
<b>Government</b>	7,400	1.3	-16,900	-2.9

Source: U.S. Bureau of Labor Statistics, 2016.

The Chicago metro area and the State have tended to experience a higher percentage of job losses during recessions, as well as lower employment gains during periods of economic expansion when compared to the national average (Table 23 on the next page). McHenry County has tended to follow the national trends exhibiting the same pattern of job gains and losses up until the most recent recession. Although the reasons for this shift in employment growth patterns following the recession are unclear, it may relate in some way to the drop in labor force participation rates or the growth in the number of residents commuting to jobs outside the district.

**Table 23: Non-Farm Employment Change through Recent Business Cycles**

Area Name	Expansion	Recession	Expansion	Recession	Expansion	Recession	Expansion
	11/1982 6/1990	6/1990 3/1991	3/1991 2/2001	2/2001 11/2001	11/2001 11/2007	11/2007 6/2009	6/2009 9/2016
<b>McHenry County</b>	58.6%	0.5%	38.9%	-0.2%	23.3%	-4.6%	-0.9
<b>Chicago Metro</b>	19.3%	-2.9%	15.2%	-2.0%	5.7%	-5.2%	4.8
<b>Illinois</b>	15.1%	-3.3%	11.7%	-1.3%	5.9%	-5.9%	3.0
<b>U.S.</b>	20.0%	-1.1%	17.0%	-1.0%	7.6%	-4.5%	8.5

Source: Illinois Department of Employment Security, 2016; U.S. Bureau of Labor Statistics, 2016.

### Labor Force Participation

The unemployment rate estimates the percentage of workers in the labor force who are currently unemployed but seeking work, while the labor force participation rate is the percentage of the population 16 and older who are either working or actively seeking work. Participation rates have declined steadily since the 1990s. Since the last recession this decline has accelerated, thus many analysts believe that the official unemployment rate understates the employment situation because it does not account for the growing number of people who have dropped out of the labor force. The participation rate is affected by the number of discouraged workers who are no longer seeking employment, so it is important to consider labor force participation along with the unemployment rate.

Demographic shifts are also likely contributors to the trend toward lower participation rates as growing numbers of “Baby Boomer” move into retirement and lower birth rates and out migration leaves a smaller pool of younger workers to replace them. Although state and national data suggest that older workers are staying in the workforce longer than in the past, it may not be enough to offset the overall downward trend<sup>14</sup>. In addition, labor force participation among younger working age people fell significantly between 2002 and 2012, but has begun to recover since then<sup>15</sup>.

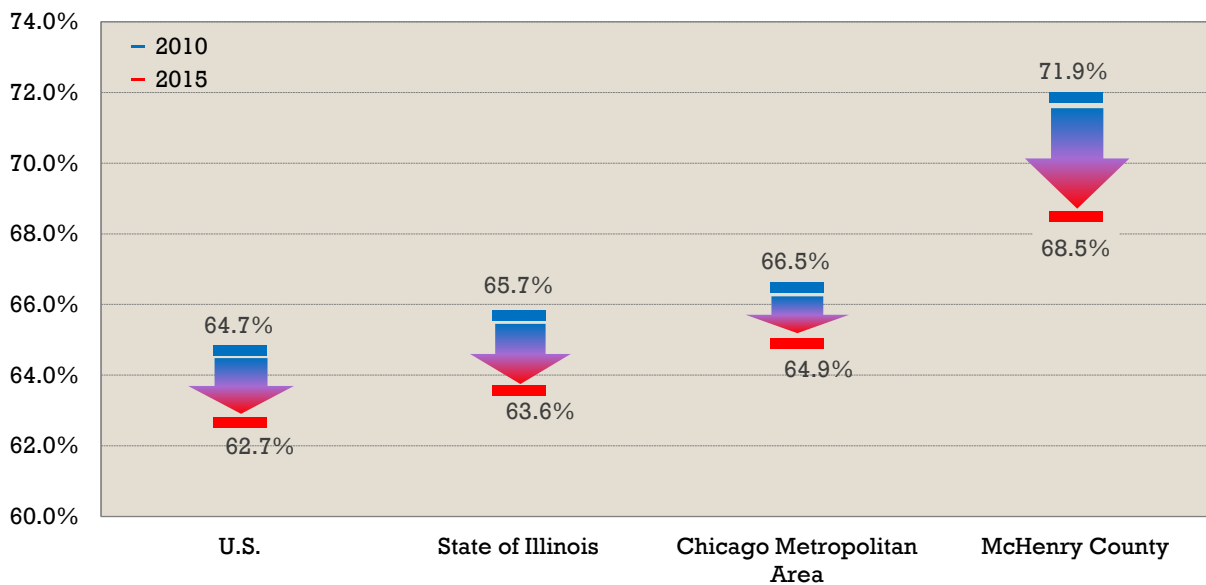
Figure 18 compares labor force participation rates (LFPR) for McHenry County with the Chicago metro area, Illinois, and the U.S. While the LFPR in McHenry County compares

<sup>14</sup> Despite fluctuations following the 2002 and 2008-2009 recessions, labor force participation of persons 65 year of age and older increased from 16.3 in 2002 to 19.9 in 2015. The U.S. LFPR for this age group, though lower, followed a similar trajectory. Data source: U.S. Bureau of Labor Statistics, 2016.

<sup>15</sup> Reference BLS data.

favorably, it follows the same downward trend. In fact, LFPR is falling much faster than the region, state, or nation. Given the changes in the post-recession job market, it is likely that many of the unemployed and other job seekers are struggling to match their skills, education, and experience to the new reality. This also suggests that it may be some time before a more broadly based economic recovery takes hold.

Figure 18: Labor Force Participation Rate Trend  
U.S., Illinois, the Chicago Metropolitan Area and McHenry County



Source: U.S. Census Bureau, Current Population Survey; U.S. Bureau of Labor Statistics, 2016.

Unemployment hits different age groups differently. As more Baby Boomers remain in the workforce to shore up lost savings during the recession, those graduating from high

school are having a harder time finding entry level positions. Looking at ages 18 and greater statewide, the percentages have slightly changed from 2010 to 2015. Those that have not been able to participate in the labor force or attend school has increased from 28.3% to 29.9%. Labor force participation has decreased as well.

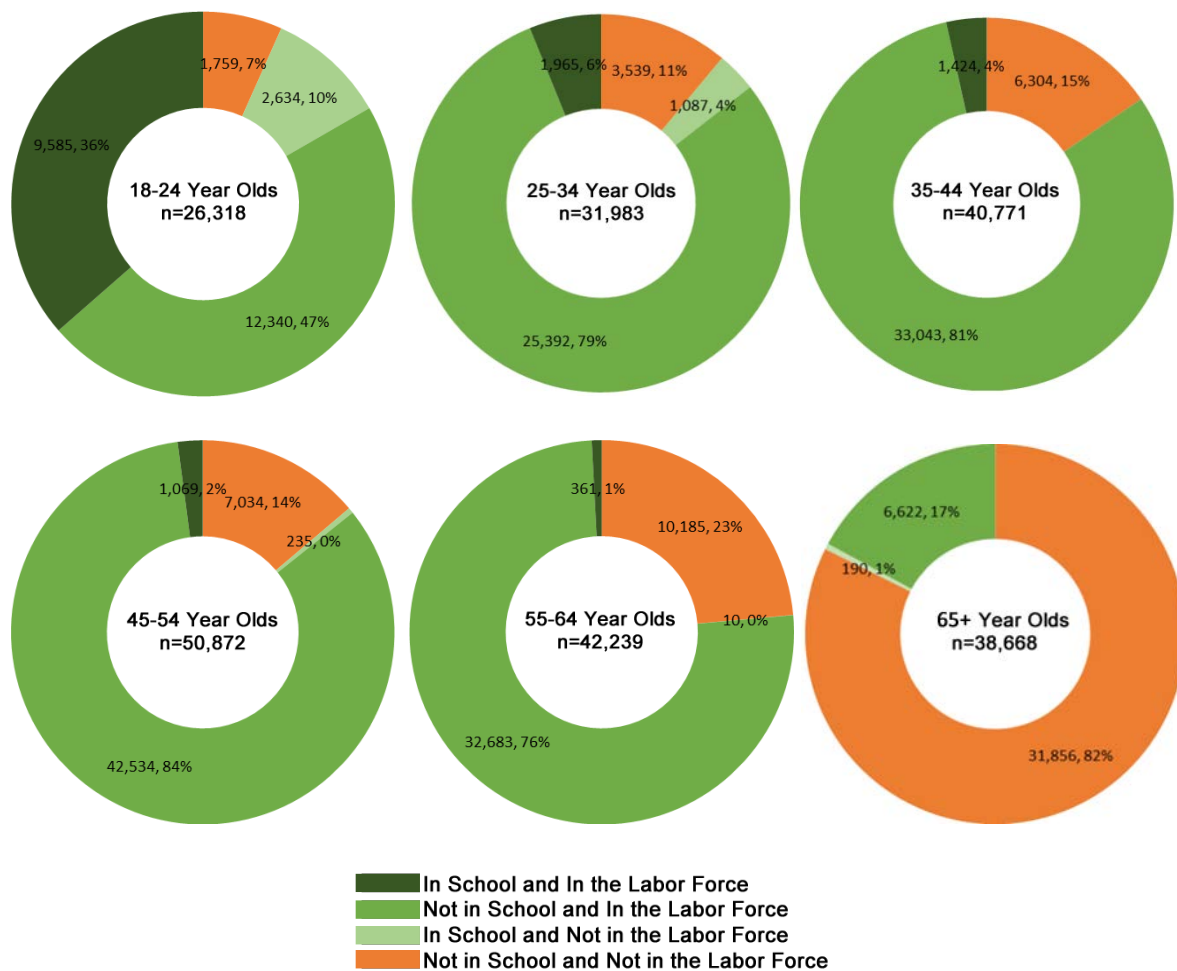
Table 24: Illinois Labor Force/School Participation

Status	2010	2015
Not in School, Not in Labor Force	28.3%	29.9%
Not in School, In Labor Force	60.2%	59.8%
In School, Not in Labor Force	3.9%	3.6%
In School, In Labor Force	7.6%	6.7%

Source: IPUMS-USA, University of Minnesota, www.ipums.org.

Breaking these numbers down in Figure 19 in McHenry County by age group an interesting pattern emerges. There are 1,759 18-24 year olds that are not in school and not in the labor force (indicated in orange). The green indicates some level of connection whether it is working, going to school or both. There is no distinction for full or part time positions or whether the wages are sustainable, but rather gives an overview as to their level of engagement in society.

Figure 19: Age Groups by School Attendance and Labor Force Participation



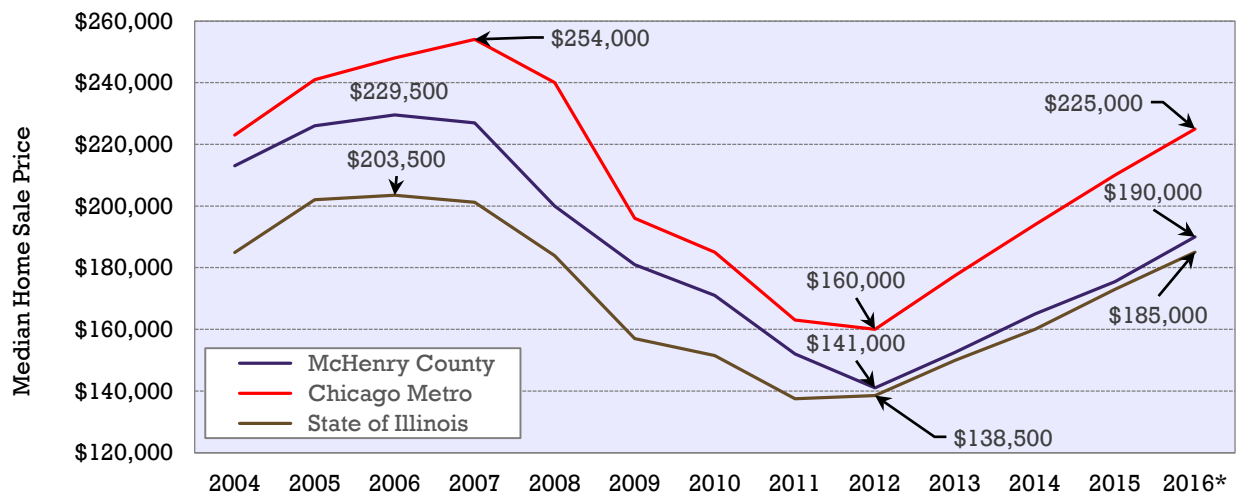
Source: IPUMS-USA, University of Minnesota, www.ipums.org.

## Housing

The middle class was disproportionately impacted by the collapse of the housing market in the mid-2000, since their homes are their primary tangible asset. Residential property values along with sale prices fell dramatically between 2005 and 2012, resulting in many homeowners holding mortgages that are considerably greater than the value of their homes. Communities have also been adversely effected as declining real estate values driven by foreclosures and declining sales have been forced to raise taxes and cut services further depressing the market. However, since 2012, homes sales and sale prices have begun a slow but steady recovery (Figure 20). McHenry County and the Chicago metro area have led the State in this rebound of the residential, although median home sale prices are still below the pre-recession highs. The median home sale price in McHenry County fell by 58.8% between 2007 and 2012. Sale prices have since increased by 40.6% through the third quarter of 2016. This recovery far outpaced the rebound in the Chicago metro area (34.8%) and the State of Illinois (33.6%), indicating the McHenry County is regaining some of its economic momentum.

This is also good news for higher education institutions as it suggests more fiscal stability in the long-term, as well as improving individual and household finances which can directly affect college enrollments and degree completion.

Figure 20: Median Home Sale Price Trend, 2004-2016\*



\*Year-to-date (January through September, 2016).

Source: Illinois Association of Realtors, 2016.



## Financing College

The availability of financial aid has an enormous impact upon the ability of low-income students and students of color to attend a postsecondary institution. Compared with students at four-year public and private institutions, community college students are much more likely to come from low-income households, to be first-generation college students, and to attend part time while working or taking care of children.<sup>16</sup> Illinois community colleges serve 79% of all Latino students, 70% of all African American students, and 66% of all minority students in higher education.<sup>17</sup> Even modest increases in tuition can require families to make difficult budget decisions and defer or destroy the dreams of students.

The primary tool used to protect the affordability of postsecondary education is financial aid. Historically, this has been tied to continuous full-time attendance directly after high school, which is no longer the way many people approach postsecondary education. Financial aid comes in a variety of forms through federal funding via Pell and SEOG Grants, Stafford Loans, and workforce development grants. It is also provided at the state level through grants, scholarships, and loans. In FY2015, of the approximately \$1.13 billion in Federal grant aid received by students attending Illinois schools, about 35 percent, or \$401 million, went to community college students<sup>18</sup>. Illinois community colleges receive more of these federal dollars than any other sector.

The Free Application for Federal Student Aid (FAFSA) completion rate can provide insights on how many seniors anticipate attending college. The FAFSA is the first step in gaining access to grants, student loans and work-study funding. In McHenry County, there were 15 high schools serving 4,417 seniors in the 2015 academic year (see Table 25). Of these seniors, over 59%, or 2,616 students, completed the FAFSA application process. Marian Central Catholic High School had the highest completion rate of 71.6%, or 136 students while Harvard

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<sup>16</sup> National Center for Education Statistics. (2009). *National postsecondary student aid study: 2007–08* (NPSAS:08). Washington, DC: U.S. Department of Education. Available from <http://www.nces.ed.gov/das>

<sup>17</sup> Cook County Teachers Union (November 28, 2012). The system is broken: Solving inequities in MAP grant funding. Retrieved from <http://ccctu.org/archives/4771>

<sup>18</sup> Source: U.S. Department of Education office of *Federal Student Aid* (2016). *Title IV Program Volume Reports*. Retrieved on November 15, 2016 from <https://studentaid.ed.gov/sa/about/data-center/student/title-iv>.

High School had the lowest completion rate of 33.7%, or 56 students. Huntley High School had a completion rate of 64.0%, but that amounted to 428 students, the highest number of students anticipating college.

**Table 25: FAFSA Completions in High Schools, 2015**

High Schools	# FAFSA Completed	Seniors in School	Senior Completion Rate
Alden-Hebron High School	16	33	48.5%
Cary-Grove Community High School	298	464	64.2%
Crystal Lake Central High School	226	385	58.7%
Crystal Lake South High School	301	476	63.2%
Harvard High School	56	166	33.7%
Huntley High School	428	669	64.0%
Johnsburg High School	112	184	60.9%
Marengo High School	96	187	51.3%
Marian Central Catholic High School	136	190	71.6%
McHenry East High School	116	217	53.5%
McHenry High School-West Campus	200	402	49.8%
Prairie Ridge High School	254	401	63.3%
Richmond-Burton High School	123	203	60.6%
Woodstock High School	127	222	57.2%
Woodstock North High School	127	218	58.3%

Source: Illinois Student Assistance Commission.

Obtaining state financial assistance has become more competitive in recent years as the amount of available aid runs out quickly and students or families who delay in submitting their applications for assistance miss what funds are out there. The Monetary Award Program (MAP) which provides grants suffered from funding shortfalls during the FY2012-2013 school year and about half the applications received were “suspended” because the funding ran out. MAP award availability peaked in that FY2013 school year at \$411.6 million and declined to \$363.7 million by FY2015<sup>19</sup>. Grants awarded to students at Illinois community colleges fell from \$56.8 million in FY2012 to \$39.8 million in FY2015. As a share of MAP awards, the community college share fell from 13.7% in FY2012 to 10.9% in FY2015.

Since FY 2015, the inconsistency with state budgeting has created significant uncertainty for Illinois students and higher education institutions. No state budget has been in place at the

<sup>19</sup> Illinois Student Assistance Commission (2016). *Basic ISAC Program Data*.

beginning of that last two school years. Many colleges are crediting students' accounts in the expectation that MAP funds will eventually be appropriated. However, others are not, pushing the cost of college out of reach for some students.

Illinois has several other financial aid programs to help traditional and non-traditional students pursue their college education. These include the College Savings Bond Bonus Incentive Grant Program, which awards a grant to beneficiaries of an Illinois College Savings Bond. Illinois also has a Higher Education License Plate (HELP) program providing grants to students who attend Illinois colleges that participate in the sale and distribution of special collegiate license plates.

Other college financing vehicles include Lifelong Learning Accounts (LiLAs), portable educational accounts that workers can use to finance their education and training. Employers are encouraged to participate through tax credits. Prepaid tuition plans or 529 plans are also an option for financing college. Offered by many states, these plans guarantee an increase in value at the same rate as college tuition. For example, if someone buys shares worth one semester of tuition at a community college, those shares will always be worth one semester of tuition there, even 10 years later when tuition rates have risen. Prepaid plans offer the same tax and distribution benefits as education saving plans.

Recent federal legislation in response to the fiscal cliff had important implications for community college students. According to the American Association of Community Colleges, the recent legislation that cleared Congress earlier this month provided the following benefits to students attending community college: a five-year extension of the American Opportunity Tax Credit; permanent extension of employer-provided educational assistance; and the permanent deduction of student loan interest.<sup>20</sup>

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<sup>20</sup> American Association of Community Colleges. (2013). *Fiscal cliff legislation contains important wins for community college students*. Retrieved from <http://www.aacc.nche.edu/newsevents/News/articles/Pages/010220131.aspx>

## SECTION 5: QUALITY - Delivering Quality through Our People and Our Programs

“Quality” is producing educational outputs and outcomes that meet or exceed the expectations of students, employers, and the community and contribute to quality of life in McHenry County. Information presented for this attribute addresses accountability, technology, readiness to learn, and resource availability.

### Accountability

Over the past four decades, the American public has become increasingly skeptical of higher education as an unquestioned public good. This concern dates back to the 1970s, a decade that experienced a recession and resulting decline in public revenues as well as concern over anticipated enrollment declines resulting from the end of the baby boom.<sup>21</sup> It grew in the 1980s with *A Nation at Risk*<sup>22</sup> and that report’s focus on the lack of learning in public schools, a focus that quickly expanded to include colleges and universities. During the 1990s another landmark publication, *Reinventing Government*,<sup>23</sup> shifted attention to measuring institutional performance as the nation grew increasingly doubtful over higher education’s ability to prepare students for the knowledge economy.

When Education Secretary Margaret Spellings convened her Commission on the Future of Higher Education in 2005, another recession and rising Medicaid costs had combined to further reduce public funding for higher education, while the demand for workforce development and teacher training was growing. Students and their families were expected to pay a rising share of their college education, yet there was little performance or outcome data available to help them select an institution. It was no surprise when, in the fall of 2006, the Spellings Commission called for a more rigorous system of accountability and transparency about cost, price, and student success outcomes for American colleges and universities.<sup>24</sup>

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<sup>21</sup> Burke, J.C. (Ed.), 2004. *Achieving Accountability in Higher Education: Balancing Public, Academic, and Market Demands*. San Francisco: Jossey-Bass.

<sup>22</sup> National Commission on Excellence in Education (1983). *A Nation at Risk: The Imperative for Educational Reform*. Washington, D.C.: U.S. Government Printing Office.

<sup>23</sup> Osborne, D. & Gaebler, T. (1992). *Reinventing Government: How the Entrepreneurial Spirit is Transforming Public Government*. New York: Plume.

<sup>24</sup> Commission on the Future of Higher Education (2006). *A Test of Leadership: Charting the Future of U.S. Higher Education*, September 2006.

This call for accountability has been met by myriad publicly and privately supported initiatives aimed at proving the value and effectiveness of postsecondary education. Appendix B presents information on 23 of these initiatives, all of which are intended to help prospective students determine whether a specific institution is likely to help them meet their educational and career goals. In reviewing the types of efforts, “effectiveness” has multiple meanings and interpretations that include learner outcomes, institutional growth and change, value added, organizational efficiency, stakeholder satisfaction, and ratings and rankings.<sup>25</sup>

McHenry County College is well-positioned in this complex accountability landscape. For example, MCC is one of 269 community colleges across the U.S. that participated in the National Community College Benchmark Project (NCCBP). Responding to requirements for inter-institutional comparisons, Johnson County Community College established the NCCBP with other colleges across the U.S. to standardize a nation-wide benchmark reporting process. NCCBP participants receive reports on 25 benchmarks in the categories of institutional effectiveness, community and workforce development, and students and student outcomes and have access to effective practices from other participating institutions.

Measures of learner progress are essential for communicating quality to MCC’s audiences. One of the most important accountability initiatives in this regard is the community college-initiated Voluntary Framework of Accountability (VFA), the first national system of accountability specifically by and for community colleges. Metrics are being defined that will gauge how well community colleges are performing in student progress and outcomes as well as in workforce, economic, and community development areas.

Of importance to MCC’s future are the VFA’s Student Progress and Outcomes measures that will help community colleges determine whether students are fulfilling their educational objectives, whether it is to obtain a credential or simply to take one or more courses without obtaining a credential. These measures will address short-term progress as well as long-term outcomes of all community colleges.<sup>26</sup> This has been a critical issue for community colleges

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<sup>25</sup> Alfred, R. L. (2011). The future of institutional effectiveness. *New Directions for Community Colleges*, 153. 103-113.

<sup>26</sup>

<http://www.aacc.nche.edu/Resources/aaccprograms/VFAWeb/Documents/VFABrochure%20LowResolution.pdf>

who historically have been limited to defining success as the number of program and certificate completions.

The development of interoperable longitudinal data systems that contain individual learner progress and outcome data from multiple sources will help institutions link education with outcomes. This effort is under way in many states, including Illinois through the statewide Illinois Longitudinal Data System (ILDS). Coordinated by the Illinois State Board of Education, when fully developed, this system will help track outcomes of students from pre-kindergarten through postsecondary education and into the workforce. <sup>27</sup> The Illinois Community College Board is one of several postsecondary education partners on the ILDS Data Advisory Committee.

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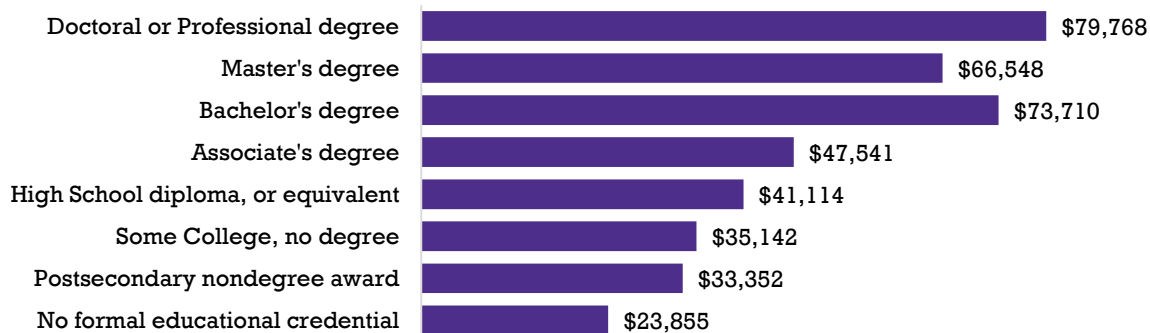
<sup>27</sup> <http://www.isbe.state.il.us/ilds/default.htm>

**Return on Investment.** Although the American public and their legislators are demanding increased accountability of higher education, improved reporting on performance and effectiveness will be for naught unless it speaks to the value of the investment. Institutions are using a variety of measures to make the case that investing in higher education benefits communities and the region. The most direct return is in increased earnings that result from various levels of postsecondary education. The Illinois Department of Employment Security publishes the median wages of occupations for all wage earners by county. The cross-referencing of these occupations by the required preparation for each yields an estimated weighted median wage by preparation level.

The relationship of educational attainment to earnings is well documented. Figure 21 displays data specific to McHenry County's workforce. At the county level, there are some exceptions to the rule that more education equals more earnings. Due to the unique supply and demand factors operating in McHenry County, occupations requiring bachelor's degrees generally have higher median wages than those requiring a Master's degree. This can at least partially be explained by the large numbers of chief executives and engineering occupations in the county.

Another surprising outcome is the relatively high median pay of occupations requiring a high school diploma. The availability of well-paying jobs requiring this level of education combined with an aging workforce that has accumulated earnings gains over the years are major contributing causes for this condition. It is likely that as the incumbent workers retire out of these positions, their replacements may be expected to have higher levels of education.

Figure 21: McHenry County Weighted Median Wage by Preparation Level



Source: Illinois Department of Employment Security, Occupational Employment Statistics, 2015.

In 2014, the Illinois Community College Board commissioned Northern Illinois University's Center for Governmental Studies (CGS) to conduct a statewide economic impact analysis as well as provide individual community college impact analyses each individual college. The reports analyzed earnings outcomes for program completers. Education at a community college can be viewed as an investment. Students attending college pay for their education in both cash and in foregone earnings. The net cash price is the cost of tuition, fees, books, and room and board. Foregone earnings result when a student spends time going to school and studying in place of earning money at work.

The analysis in this section focuses on the return on investment of students that completed a program, referred to as 'completers', in FY2011. The cost of attending school during the FY2010 and FY2011 school years is compared with projected earnings over a 40-year post graduation period. The results are net present value (NPV) and internal rate of return (IRR) estimates for the average completer in FY2011.

The net cash price of attending school was obtained from the National Center for Education Statistics' College Navigator tool. College Navigator employs Integrated Postsecondary Education Data System (IPEDS) data from the National Center for Education Statistics to calculate the 'average net price' for annual attendance at each school.

The other major cost for college attendees is their foregone earnings, often referred to as the 'opportunity cost' of attending college. The estimate for foregone earnings is based on completers' earnings in the 12 months prior to their enrollment in the college. It is assumed that their average income would have increased by 3% per year during their two years in college.

The major benefit of completing college is the resulting increased earnings. Pre-enrollment to post-completion earnings gains were calculated for graduates of 2-year Associate of Applied Science and 2-year certificate programs at McHenry County College. These are the completers most likely to directly enter the workforce and not pursue additional education directly following their community college completion. Gains for these graduates averaged \$10,083 in the first year.



Table 26 on the next page presents the net return analysis based on the calculations noted above. The total cost during the two years the student is in school, including out of pocket expenses and foregone earnings is \$30,466. The return on investment occurs over a 40-year working life, where increased earnings for a degree completer are estimated to total over \$760,000 (compared to someone not attending community college).

**Table 26: Estimated Net Return for MCC Associate Degree Completers<sup>28</sup>**

Year	Net Price	Opportunity Cost	Total Cost	Increased Earnings	Discounted Cash Flow
-1	\$3,746	\$11,520	\$15,266		\$15,876
0	\$3,333	\$11,865	\$15,200		\$15,200
1				\$10,083	\$10,503
2				\$10,385	\$10,385
3				\$10,697	\$10,269
4				\$11,018	\$10,154
5				\$11,348	\$10,040
...	...	...	...	...	...
38				\$30,100	\$6,924
39				\$31,003	\$6,846
40				\$31,933	\$6,769
		Total Increased Earnings		\$760,269	NPV \$309,063
					IRR 28.4%

The net present value of investing in an MCC associate degree is about \$309,000. If a student put \$30,466 in an investment that returned 40 annual payments equivalent to the earnings gains from an associate degree, they would earn interest at a rate of 28.4%.

This analysis is conservative because it is based on increased earnings in the first post-completion year. Earnings for many program completers grow significantly in the second through fifth post-completion years.

The earnings outcome results for McHenry County College were significantly higher than the statewide average for all Illinois community college completers. Statewide, the average net present value for completers of 2-year Associate of Applied Science and 2-year certificate

programs was about \$192,000. The average ROI across the state, based on a typical initial investment of \$43,331, was 14.2%<sup>28</sup>.

### Occupational Employment Growth and Opportunities for Higher Education

Projected openings in the coming years are expected to be highest for lower skilled, primarily service occupations. Table 27 shows 2012 employment levels and expected job openings through 2022. The openings account for both industry growth and replacement workers for those that leave their jobs for any reason, including retirements. Occupations requiring a postsecondary certificate are expected to have about 270 annual job openings and those requiring an associate degree will add an additional 81 per year.

**Table 27: Education Level by Projected Job Openings per Year**

Education Attainment	2012 Employment	Annual Openings 2012-2022	Weighted Median Wages
No formal educational credential	31,988	1,761	\$23,882
High school diploma or equivalent	42,068	1,654	\$42,873
Bachelor's degree	20,418	804	\$71,746
Postsecondary non-degree award	6,286	269	\$39,361
Associate's degree	1,861	81	\$74,687
Doctoral or professional degree	1,909	80	\$84,107
Some college, no degree	2,301	75	\$34,971
Master's degree	1,552	59	\$67,776
<b>Total</b>	<b>108,383</b>	<b>4,783</b>	<b>\$42,395</b>

Source: Illinois Department of Employment Security, Occupational Wages 2012, Bureau of Labor Statistics Education & Training Data 2015.

In addition to understanding the educational attainment characteristics, it is important to note how occupation growth trends relate to MCC degree and credentialing programs in areas where it has invested considerable resources in the development of programs and curricula to meet current and anticipated future demand. These are construction, manufacturing, healthcare, culinary and food services and business and management.

<sup>28</sup> Source: Center for Governmental Studies (2014). *Illinois Community Colleges' Economic Impacts*.

Despite many setbacks during the last recession, the construction industry is projected to grow significantly, adding 2,136 jobs through 2022 (Table 28). The area of greatest job growth is expected to be among specialty trade contractors.

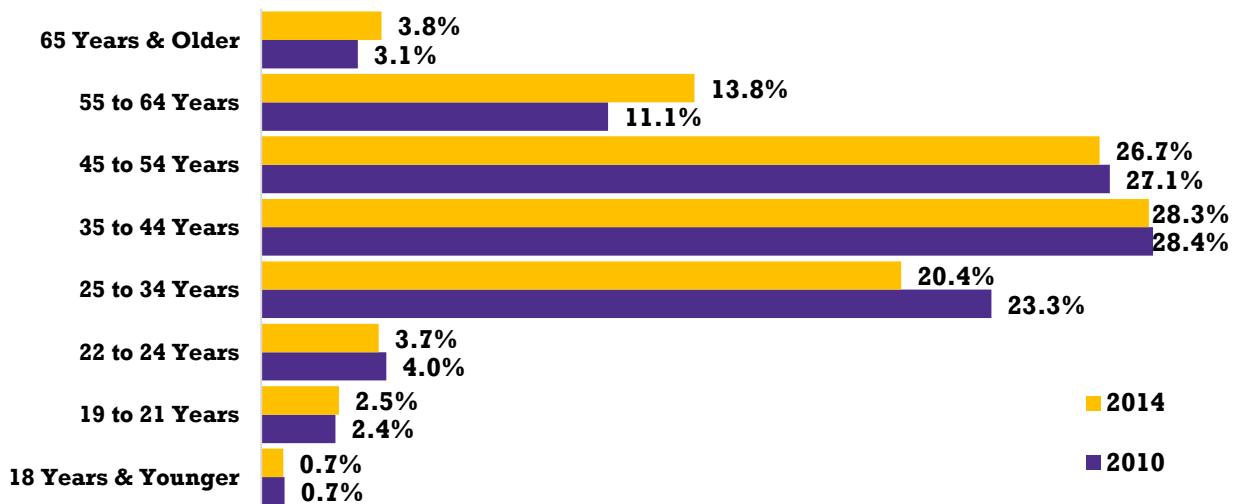
**Table 28: Construction Industry Employment Projections, McHenry County, Illinois 2012-2022**

North American Industrial Classification System (NAICS)		Employment		Change
Code	Title	2012	2022	2012-2022
<b>230000</b>	Construction	5,953	8,089	2,136
<b>236000</b>	Construction of Buildings	816	1,066	250
<b>237000</b>	Heavy and Civil Engineering Construction	1,206	1,679	473
<b>238000</b>	Specialty Trade Contractors	3,931	5,344	1,413

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

As with many industries, the aging of the workforce and the growing need for younger people to replace workers as they retire is an important issue. As Figure 22 illustrates, the proportion of workers 55 years of age and older increased significantly from 2010 and 2014 while those under 35 declined.

**Figure 22: Age Distribution of Construction Industry Employees McHenry County, Illinois, 2010-2014**



Source: U.S.Census Bureau, Center for Economic Studies, Quarterly Workforce Indicators, 2016.

This presents a serious challenge for construction companies as they try to hire people for new jobs as well as finding workers to replace those that are expected to retire. This also presents McHenry Community College with the opportunity to help local contractors through its Fast Track Construction management programs. These programs prepare those that are currently employed or seeking employment as construction supervisors, managers or building inspectors. Data from the Illinois Department of Employment Security projects a demand for 180 workers in the occupations between 2012 and 2022 (Table 29) in McHenry County alone.

**Table 29: Selected Construction Occupational Employment Projections, McHenry County, Illinois, 2012-2022**

Standard Occupational Classification	Title	Employment		Change 2012-2022	New Jobs	Replacement Jobs	Total
		2012	2022				
<b>47-1011</b>	1st-Line Supervisors/Managers Construction/Extraction	332	436	104	100	40	140
	Construction & Building Inspectors	80	101	21	20	20	

Note: Figures may not add because of rounding.

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

Although the manufacturing sector continues to be disrupted by global competition, rapid technological changes, and a challenging economic climate overall, Illinois has consistently ranked in the top five among the states for manufacturing employment. Approximately 70% of the States’ 580,000 manufacturing jobs are located in the Chicago metro area<sup>29</sup>. Despite the negative public perceptions about industrial careers, manufacturing wages are also higher than many other industry sectors and offer significant advancement potential to those that are willing to broaden their skillset. Although employment growth is expected to be modest at best in the manufacturing sector, with some industries experiencing net losses in the number of jobs between 2012 and 2022, the demand for replacement workers is expected to be strong as older workers retire (Table 30 on the next page).

<sup>29</sup> Source: U.S. Bureau of Labor Statistics, Current Employment Statistics survey program, *State and Area Employment, Hours, and Earnings*, 2016.

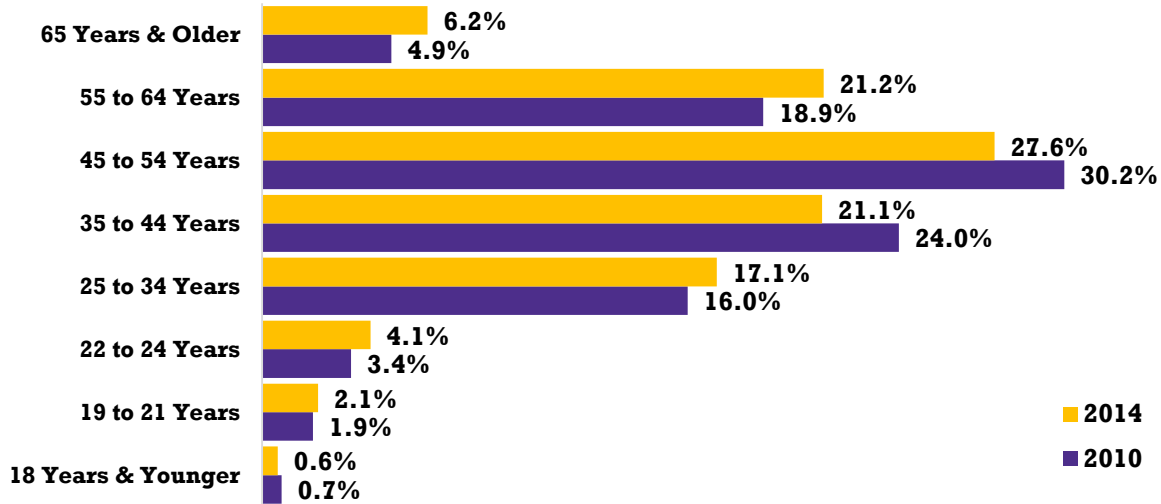
**Table 30: Manufacturing Industry Employment Projections, McHenry County, Illinois 2012-2022**

North American Industrial Classification System (NAICS)		Employment		Change
Code	Title	2012	2022	2012-2022
300000	<b>Manufacturing, Total</b>	<b>15,409</b>	<b>16,941</b>	<b>1,532</b>
310000	<b>Non-Durable Goods Manufacturing, Total</b>	<b>6,641</b>	<b>7,022</b>	<b>381</b>
311000	Food Manufacturing	1,112	1,392	280
313000	Textile Mills	100	103	3
314000	Textile Product Mills	110	135	25
321000	Wood Product Manufacturing	71	80	9
322000	Paper Manufacturing	190	173	-17
323000	Printing & Related Support Activities	1,483	1,118	-365
325000	Chemical Manufacturing	524	508	-16
326000	Plastics and Rubber Products Manufacturing	2,753	3,207	454
326900	<b>Durable Goods Manufacturing, Total</b>	<b>8,768</b>	<b>9,919</b>	<b>1,151</b>
327000	Nonmetallic Mineral Product Manufacturing	569	567	-2
331000	Primary Metal Manufacturing	439	533	94
332000	Fabricated Metal Product Manufacturing	2,822	2,931	109
333000	Machinery Manufacturing	1,821	2,238	417
334000	Computer and Electronic Product Manufacturing	748	755	7
335000	Electrical Equipment, Appliance & Component Manufacturing	896	1,076	180
336000	Transportation Equipment Manufacturing	98	124	26
337000	Furniture and Related Product Manufacturing.	164	205	41
339000	Miscellaneous Manufacturing	1,211	1,490	279

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

**Manufacturing** and related industries are also confronting the aging workforce, despite the long-term declines in the number of jobs in many sectors. Businesses are being challenged to up-skill their existing workforce while trying attract a new generation of workers with a greater breadth and depth of skills and training than in the past to replace those that are retiring or will retire over the next decade. Over one-half of manufacturing employees in McHenry County are 45 years of age or older. Although workers 35 years and younger increased slightly between 2010 and 2014, those 55 years and older are proportionally much larger and growing faster. This 55 and older group, which is potentially on the verge of retirement, has grown from 23.8% of the manufacturing workforce in 2010 to 27.4% in 2014. In addition to trying to counter negative perceptions about manufacturing career opportunities, companies are struggling to replace the wave of retiring workers and doing so with new workers that have a higher-level skills and abilities than were needed in the past.

Figure 23: Age Distribution of Manufacturing Industry Employees  
McHenry County, Illinois, 2010-2014



Source: U.S.Census Bureau, Center for Economic Studies, Quarterly Workforce Indicators, 2016.

McHenry Community College is responding to this need by offering a variety of industrial training and credentialing programs (see sidebar). These programs prepare current or aspiring manufacturing workers in a variety of production, installation, industrial maintenance, and repair occupations. These occupations account for 75% to 80% of the jobs in the manufacturing sector. Data from the Illinois Department of Employment Security projects a demand for nearly 5,800 workers in these occupations between 2012 and 2022 (Table 31) in McHenry County alone.

**McHenry County College Programs that map to Manufacturing and Industrial Careers**

- AUTOMOTIVE TECHNOLOGY AAS
- AUTOMOTIVE TECHNOLOGY AAS, MANAGEMENT OPTION
- AUTOMOTIVE MAINTENANCE TECHNICIAN CERTIFICATE
- ADVANCED AUTOMOTIVE TECHNICIAN CERTIFICATE
- INDUSTRIAL MAINTENANCE TECHNICIAN CERTIFICATE
- ENGINEERING TECHNOLOGY AAS
- ADVANCED MANUFACTURING CERTIFICATE
- CNC CERTIFICATE
- MANUFACTURING MANAGEMENT AAS
- ROBOTIC SYSTEMS ENGINEERING AAS
- ROBOTIC SYSTEMS PROGRAMMER CERTIFICATE
- WELDING BOOT CAMP

**Table 31: Selected Manufacturing Occupational Employment Projections, McHenry County, Illinois, 2012-2022**

Standard Occupational Classification		Employment		Change 2012-2022	New Jobs	Replacement Jobs	Total
Code	Title	2012	2022				
11-3051	Industrial Production Managers	169	191	22	20	30	50
51-0000	Production Occupations	10,731	12,305	1,574	1,740	2,140	3,880
51-1000	Supervisors, Production Workers	657	734	77	80	90	170
51-1011	1st-Line Supervisors/Managers Production/Operating Workers	657	734	77	80	90	170
51-4011	Computer-Controlled Machine Tool Operators	230	297	67	70	60	130
51-4012	Numerical Tool/Process Control Programmers	31	45	14	10	10	20
51-4041	Machinists	711	878	167	170	160	330
51-4111	Tool & Die Makers	131	153	22	20	10	30
51-4121	Welders, Cutters, Solderers & Brazers	307	355	48	50	80	130
51-4122	Welding/Soldering Machine Setters/Operators	68	92	24	20	20	40
49-0000	Installation, Maintenance & Repair Occupations	3,910	4,821	911	910	900	1,810
49-1000	Supervisors Installation/ Maintenance/Repair Workers	263	322	59	60	70	130
49-1011	1st-Line Supervisors/Managers- Mechanics/Installers	263	322	59	60	70	130
49-3021	Automotive Body & Related Repairers	203	256	53	50	40	90
49-3023	Automotive Service Technicians/ Mechanics	679	801	122	120	170	290
49-9021	HVAC Mechanics & Installers	216	290	74	70	60	130
49-9041	Industrial Machinery Mechanics	269	373	104	100	80	180

Note: Figures may not add because of rounding.

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

**Food service** is one of the largest and fastest growing industries in the region. Between 2012 and 2014, the industry is expected to add over 2,300 net new jobs in McHenry County alone (Table 32).

Historically, the industry has offered a substantial number of entry-level roles for younger people looking to gain job experience. Though job opportunities are plentiful, most are part-time, wages tend to be lower than other industries and turnover much higher. However, there are also many positions in management and skilled culinary professions that are both personally and financially rewarding and provide stable career paths.

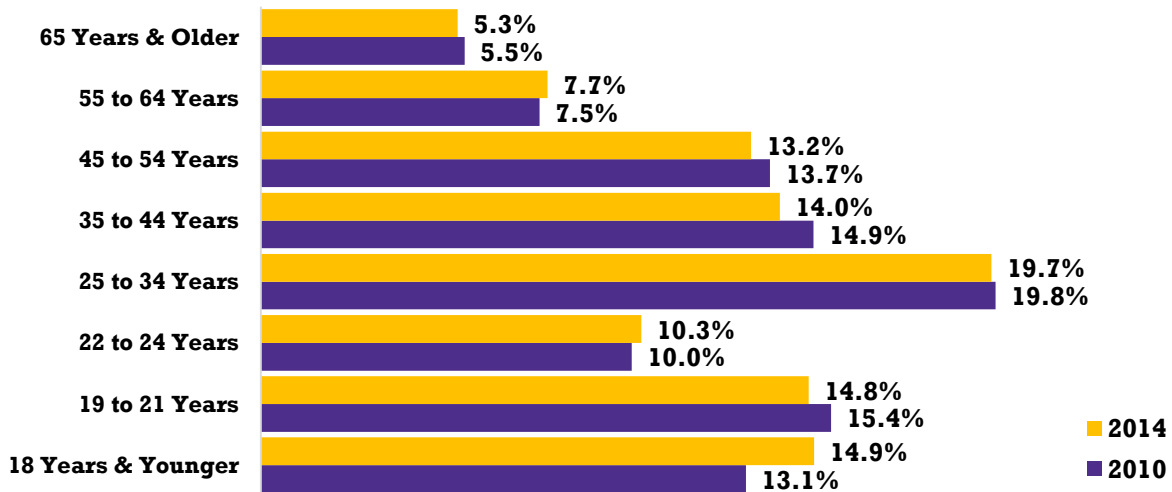
**Table 32: Food Service Industry Employment Projections, McHenry County, Illinois 2012-2022**

North American Industrial Classification System (NAICS)		Employment		Change
Code	Title	2012	2022	2012-2022
<b>722000</b>	Food Services and Drinking Places	7,749	10,083	2,334

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

Unlike some other industries, food services have a much younger age profile. Nearly 60% those employed are under 35 years of age (Figure 24). Workers between 35 and 54 years of age account for approximately 27% of industry employment, but their numbers are declining. Between 2010 and 2014 workers in this age group fell by 4.4%, while workers 55 years of age and older (who only make up about 13% of industry employment) increased slightly (0.8%).

**Figure 24: Age Distribution of Food Service Industry Employees  
McHenry County, Illinois, 2010-2014**



Source: U.S.Census Bureau, Center for Economic Studies, Quarterly Workforce Indicators, 2016.



McHenry Community College offers five degree and certificate programs that can lead to rewarding careers in the food services industry (see sidebar). These programs prepare current or aspiring workers in a variety of management or skilled culinary occupations. The occupations with the highest projected number of job openings locally (i.e. within McHenry County) include supervisors and managers of food preparation and servers, restaurant cooks, and food service managers (Table 33).

**McHenry County College Programs that map to Food Service and Culinary Careers**

- BAKING AND PASTRY MANAGEMENT AAS
- CULINARY MANAGEMENT AAS
- ASSISTANT CONFECTIONER CERTIFICATE
- BAKING AND PASTRY ASSISTANT I CERTIFICATE
- CHEF'S ASSISTANT I CERTIFICATE

**Table 33: Selected Food Service Occupational Employment Projections  
McHenry County, Illinois, 2012-2022**

Standard Occupational Classification		Employment		Change 2012-2022	New Jobs	Replacement Jobs	Total
Code	Title	2012	2022				
11-9051	Food Service Managers	263	295	32	30	50	80
35-1000	Supervisors, Food Preparation & Serving Workers	635	826	191	190	170	360
35-1011	Chefs & Head Cooks	86	101	15	20	10	30
35-1012	1st-Line Supervisors/Managers Food Preparation/Serving Workers	549	725	176	180	160	340
35-2011	Cooks, Fast Food	439	523	84	80	90	170
35-2012	Cooks, Institution & Cafeteria	245	276	31	30	50	80
35-2014	Cooks, Restaurant	676	924	248	250	130	380
35-2015	Cooks, Short Order	130	153	23	20	30	50

Note: Figures may not add because of rounding.

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

**Healthcare** has been one of the fastest growing industries in McHenry County and the surrounding region. The Chicago metro area hosts several major hospitals, clinics, and medical research centers. Health care is one of only two sectors that experienced significant job growth through the past recession and has continued to add employment since then. Going forward, the strongest job growth is projected to be in ambulatory healthcare services as more medical services and procedures are being dispensed in out-patient settings allowing hospitals to concentrate more on major surgeries and critical care services (Table 34 on the next page).

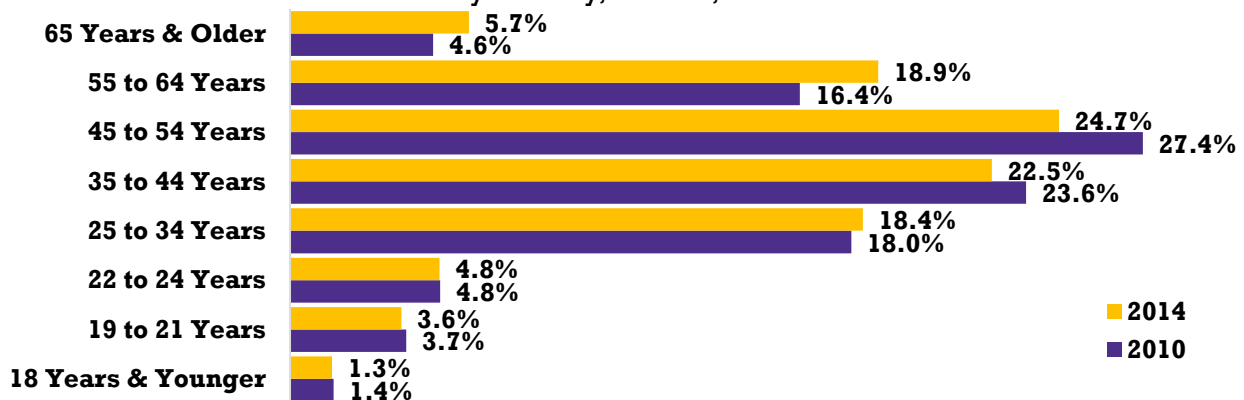
**Table 34: Selected Healthcare Industry Employment Projections  
McHenry County, Illinois, 2012-2022**

North American Industrial Classification System (NAICS)		Employment		Change
Code	Title	2012	2022	2012-2022
621000	Ambulatory Health Care Services	3,865	5,666	1,801
621100	Offices of Physicians	1,521	2,193	672
621200	Offices of Dentists	1,025	1,253	228
621300	Offices of Other Health Practitioners	733	1,223	490
621400	Outpatient Care Centers	150	211	61
621600	Home Health Care Services	317	622	305
622000	Hospitals	2,987	3,206	219
623000	Nursing and Residential Care Facilities	1,551	1,687	136

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

The healthcare industry is also facing several fundamental challenges over the next two decades. The first is the growing demand for healthcare services that is being driven by a rapidly aging population. The second is the aging of healthcare workers and the need for younger workers to fill a growing number of new, as well as existing positions. Approximately one-half of healthcare employees in McHenry County are 45 years of age or older. Although the growth in the proportion of older workers was relatively small between 2010 and 2014 (0.9%), the number of workers 35 years and younger decreased between 2010 and 2014, in addition to there being a proportionally smaller group (Figure 25).

**Figure 25: Age Distribution of Healthcare Industry Employees  
McHenry County, Illinois, 2010-2014**



Source: U.S. Census Bureau, Center for Economic Studies, Quarterly Workforce Indicators, 2016.

As the healthcare industry continues to expand in the region and older workers retire the demand for skilled professionals in the fields of nursing, physical therapy, and trauma services will increase. McHenry County College currently offers nine degree or certificate programs that can help aspiring healthcare workers or those already working in the industry to fill the expected demand from local and regional employers. The occupations that are projected to have the greatest number of openings include registered nurses, nursing assistants, medical assistants, and physical therapists (Table 35).

**McHenry County College Programs that map to Healthcare Careers**

- HEALTH INFORMATION TECHNOLOGY AAS
- NURSING AAS
- BASIC NURSING ASSISTANT TRAINING CERTIFICATE
- LPN TO NURSING AAS
- OCCUPATIONAL THERAPY ASSISTANT AAS
- PHYSICAL THERAPIST ASSISTANT AAS
- EMERGENCY MEDICAL TECHNICIAN - PARAMEDIC AAS
- EMERGENCY MEDICAL TECHNICIAN - AMBULANCE CERTIFICATE
- EMERGENCY MEDICAL TECHNICIAN - PARAMEDIC CERTIFICATE

**Table 35: Selected Healthcare Occupational Employment Projections, McHenry County, Illinois, 2012-2022**

Standard Occupational Classification		Employment		Change 2012-2022	New Jobs	Replacement Jobs	Total
Code	Title	2012	2022				
29-1122	Occupational Therapists	73	101	28	30	10	40
29-1123	Physical Therapists	156	247	91	90	40	130
29-1141	Registered Nurses	1,372	1,627	255	260	270	530
29-1171	Nurse Practitioners	55	78	23	20	10	30
29-2011	Medical & Clinical Lab Technologists	54	59	5	0	10	10
29-2012	Medical & Clinical Lab Technicians	65	82	17	20	20	40
29-2041	Emergency Medical Technicians & Paramedics	231	281	50	50	60	110
29-2061	Licensed Practical & Vocational Nurses	277	343	66	70	70	140
29-2071	Medical Records/Health Information Techs	98	126	28	30	30	60
31-1014	Nursing Assistants	714	814	100	100	140	240
31-2011	Occupational Therapist Assistants	23	36	13	10	10	20
31-2012	Occupational Therapist Aides	12	19	7	10	0	10
31-2021	Physical Therapist Assistants	49	74	25	20	10	30
31-2022	Physical Therapist Aides	42	68	26	30	10	40
31-9092	Medical Assistants	302	438	136	140	60	200

Note: Figures may not add because of rounding.

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

**Business and Management** trends as occupations are most challenging to assess because they are employed across every industry sector, although there are several industry-specific occupations that exist especially in operations roles (e.g. industrial production or construction managers). Hence, data on industry employment and age distribution of workers is not available.

McHenry County College offers 19 degrees or certificates in the various business operations or management disciplines (see sidebar). These programs can conservatively be mapped to over two dozen occupations in McHenry

County alone (Table 36). It is projected that nearly 5,300 openings will need to be filled in these fields between 2012 and 2022, with particularly high demand for general and operations

**McHenry County College Programs that map to Business and Accounting Careers**

- ACCOUNTING AAS
- ACCOUNTING CERTIFICATE
- BOOKKEEPING CERTIFICATE
- TAX PRACTITIONER CERTIFICATE
- ADMINISTRATIVE OFFICE MANAGEMENT AAS
- ADMINISTRATIVE OFFICE MANAGEMENT CERTIFICATE
- ADMINISTRATIVE OFFICE SKILLS CERTIFICATE
- LEGAL ADMINISTRATION CERTIFICATE
- MEDICAL ADMINISTRATION CERTIFICATE
- MEDICAL BILLING AND CODING CERTIFICATE
- BUSINESS MANAGEMENT AAS

**Table 36: Selected Business and Management Occupational Employment Projections  
McHenry County, Illinois, 2012-2022**

Standard Occupational Classification		Employment		Change 2012-2022	New Jobs	Replacement Jobs	Total
Code	Title	2012	2022				
11-1021	General & Operations Managers	1,465	1,825	360	360	270	630
11-2022	Sales Managers	366	452	86	90	80	170
11-3011	Administrative Services Managers	191	240	49	50	30	80
11-3071	Transportation, Storage & Distribution Managers	361	435	74	70	70	140
11-9199	Managers, All Other	1,175	1,342	167	170	260	430
13-1051	Cost Estimators	173	232	59	60	60	120
13-1111	Management Analysts	350	491	141	140	50	190
13-2011	Accountants & Auditors	537	678	141	140	160	300
29-2071	Medical Records & Health Information Technicians	98	126	28	30	30	60
41-1011	First-Line Supervisors & Managers of Retail Sales Workers	1,391	1,596	205	200	300	500
43-3031	Bookkeeping, Accounting, & Auditing Clerks	997	1,231	234	230	90	320
43-6011	Executive Secretaries & Executive Administrative Assistants	671	739	68	70	80	150
43-6013	Medical Secretaries	184	261	77	80	20	100

Note: Figures may not add because of rounding.

Source: Illinois Department of Employment Security, Industry Employment Projections, 2012 – 2022, Workforce investment Area #2 (McHenry County, Illinois), 2014.

managers, first-line supervisors, secretary and administrative assistants and bookkeepers, and accounting and auditing clerks.

## Technology

How students are accessing higher education, particularly in community colleges, is changing. Many of these changes are being driven by technology. The New Media Consortium, an international community of experts in educational technology, in partnership with the EDUCAUSE Learning Initiative, publishes annual findings on emerging technologies likely to affect learning, teaching, and creative inquiry in higher education. Their 2017 report identifies trends, challenges, and developments in higher education technology adoption.<sup>30</sup>

A major near-term (i.e., one- to two-years) trend identified is the continued advancement of blended learning driven by progress in learning analytics, adaptive learning, and innovative asynchronous and synchronous tools. Another is collaborative learning, or students or educators working together as peers or in groups. Technology is key to supporting collaborative learning models by providing 24/7 connectivity for students and educators.

Mid-term trends that will drive higher education over the next three to five years include a growing focus on measuring learning, which empowers students to take an active role in their learning through continuous data collection and analysis. The other mid-term trend identified in the NMC Horizon report is providing new types of spaces for teaching and learning that accommodate more active learning. Postsecondary classrooms will increasingly resemble real-world work and social environments in which organic interactions and cross-disciplinary problem-solving may occur.

Challenges identified in the report include:

- Improving digital literacy,
- Integrating formal and informal learning to better foster experimentation and creativity,
- closing the achievement gap between students based on socioeconomic status, race, ethnicity, or gender,

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<sup>30</sup> <http://cdn.nmc.org/media/2017-nmc-horizon-report-he-preview.pdf>

- advancing digital equity via access to broadband and online learning,
- Managing knowledge obsolescence, and
- Rethinking the role of educators vis-à-vis technology, social media, and online tools and resources

### Micro-credentialing

An unmistakable theme of these trends is the customization of the postsecondary learning experience. To do this will require more flexible methods of documenting learning achievement. MCC is in the vanguard on this issue, having implemented a “laddering curriculum” that provides students with credentials for what they have learned and that may be used to re-enter higher education.<sup>31</sup> This innovation is part of a larger trend toward micro-credentials that assess and document important learning accomplishments that are smaller than courses. Such credentials are represented by digital badges that link to the assessment and learning criteria and potentially to the work that the badge holder submitted to earn the badge.<sup>32</sup> Colleges and universities that offer digital badging will be expected to publish their criteria and assessment information so their badges may be validated.

### College Readiness to Learn

MCC recognizes the importance of ensuring that K-12 students are equipped to succeed in college. In the same report cited above in which MCC’s laddering curriculum was described as an exemplary practice, the College’s work with high school leaders in the area was also noted. MCC representatives took the COMPASS test to illustrate what students needed to know to enter college, and concluded that in several high schools, content required for No Child Left Behind standards was not adequate. Trend data on the performance of K-12 students is useful to understanding how prepared McHenry County youth are to succeed at MCC.

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<sup>31</sup> McPhail, C.J. (2011). The completion agenda: A call to action. Summary report from the November 11-12, 2010, meeting of the American Association of Community Colleges Commissions and Board of Directors. Downloaded from

[http://www.aacc.nche.edu/Publications/Reports/Documents/CompletionAgenda\\_report.pdf](http://www.aacc.nche.edu/Publications/Reports/Documents/CompletionAgenda_report.pdf).

<sup>32</sup> <http://alternative-educate.blogspot.com/2012/06/digital-badges-catalyst-in-evolution-of.html>

**Income**

Persistent achievement gaps are associated with students from low-income families, as are lower college-going rates. Table 37 presents the percentage of K-12 students who qualify for the federal Free or Reduced Lunch Program for students from low-income families. Jefferson Elementary School in Harvard has the highest rate of participation in the program at 72.6%, or 275 students. Nine of McHenry County’s 76 schools have higher percentages of low-income students than the statewide average of 49.9%.

Table 37: Schools with More than 33% Low Income Students - 2016	Enrolled	Low Income	Low Income %	City
Jefferson Elem School	379	275	72.6%	Harvard
Harvard Jr High School	570	396	69.5%	Harvard
Harvard High School	688	441	64.1%	Harvard
Crosby Elem School	775	486	62.7%	Harvard
Harrison Elem School	419	252	60.1%	Wonder Lake
Westwood Elem School	368	197	53.5%	Woodstock
Coventry Elem School	588	308	52.4%	Crystal Lake
Locust Elem School	493	258	52.3%	Marengo
Canterbury Elem School	456	236	51.8%	Crystal Lake
Ulysses S Grant Intermediate School	230	112	48.7%	Marengo
Olson Elementary School	419	195	46.5%	Woodstock
Marengo Comm Middle School	313	142	45.4%	Marengo
Mary Endres Elementary School	502	227	45.2%	Woodstock
Prairiewood Elem School	420	188	44.8%	Woodstock
Dean Street Elem School	336	150	44.6%	Woodstock
Creekside Middle School	768	341	44.4%	Woodstock
Edgebrook Elem School	527	231	43.8%	McHenry
Hilltop Elem School	463	203	43.8%	McHenry
Alden Hebron Elem School	228	98	43.0%	Hebron
Chauncey H Duker School	487	204	41.9%	McHenry
Riverwood Elementary School	690	285	41.3%	McHenry
Verda Dierzen Early Learning Ctr	702	289	41.2%	Woodstock
Alden-Hebron Middle School	84	34	40.5%	Hebron
Valley View Elem School	601	242	40.3%	McHenry
Northwood Middle School	692	260	37.6%	Woodstock
Three Oaks School	510	192	37.6%	Cary
North Elem School	649	237	36.5%	Crystal Lake
Parkland School	793	288	36.3%	McHenry
Woodstock High School	999	361	36.1%	Woodstock
McHenry Middle School	718	246	34.3%	McHenry
Woodstock North High School	871	297	34.1%	Woodstock

Source: Illinois State Board of Education, Report Card Data, 2016

### School Graduation Rates

A high school diploma is an important credential for successful transitions to both postsecondary education and the workplace. In McHenry County, the annual wage differential between jobs that require a high school diploma and those that do not is almost \$20,000. Table 38 shows graduation rates from McHenry County high schools. While only one school had a graduation rate below the state average in 2016, only three improved from 2010-2016 (Woodstock North did not exist in 2010).

Table 38: Graduation Rates	2008	2009	2010	2011	2012	2013	2014	2015	2016
Alden-Hebron High School	100.0	92.9	91.2	80.0	92.3	93.8	87.0	81.8	90.0
Cary-Grove Community High School	96.8	97.7	99.3	94.7	93.8	94.7	97.1	96.2	97.9
Crystal Lake Central High School	91.2	92.5	99.4	90.3	90.1	90.4	91.3	95.5	96.5
Crystal Lake South High School	95.5	96.3	98.3	93.8	95.7	96.0	96.2	96.2	97.6
Harvard High School	78.9	80.4	83.9	69.2	76.9	73.3	71.7	77.0	79.8
Huntley High School	93.4	98.4	96.8	93.8	90.4	92.1	88.7	91.8	91.2
Johnsburg High School	95.0	93.4	98.0	95.1	86.7	91.5	89.2	92.0	94.2
Marengo High School	96.7	95.8	91.3	91.5	94.6	93.7	86.8	91.4	91.8
McHenry East High School	98.7	89.3	97.6	89.7	91.5	93.4	92.5	90.7	91.0
McHenry High School-West Campus	94.6	94.5	95.2	92.0	90.9	89.8	91.6	87.4	91.7
Prairie Ridge High School	96.2	97.7	98.6	93.6	96.8	95.7	97.2	96.7	98.3
Richmond-Burton High School	96.2	98.5	95.5	96.4	95.2	92.9	96.1	96.4	95.6
Woodstock High School	88.9	88.1	88.6	84.0	90.0	89.8	91.3	91.5	93.3
Woodstock North High School				88.0	92.1	94.5	97.4	97.2	97.0
<b>State</b>	<b>86.5</b>	<b>87.1</b>	<b>87.8</b>	<b>83.8</b>	<b>82.3</b>	<b>83.2</b>	<b>86.0</b>	<b>85.6</b>	<b>85.5</b>

Source: Illinois State Board of Education, Report Card Data, 2008-2016.

Students are failing to successfully move through remedial programs into college-level courses in part because of insufficient financial support or poor institutional or state policies and practices.<sup>33</sup> College leaders and policy makers must also work to change state and institutional obstacles that block pathways for community college students to the baccalaureate degree because of poor transfer-of-credit policies.

Organizations such as Complete College America, the National Governors Association, and the Partnership for the Assessment of Readiness for College and Careers (PARCC), are working to improve these policies so that more students can complete postsecondary degrees. PARCC is a consortium of 24 states working to develop a common set of K-12

<sup>33</sup> Alfred, R. L. (2011). The future of institutional effectiveness. *New Directions for Community Colleges*, 153. 103-113.



assessments in English language arts/literacy and mathematics that are anchored in the college- and career-ready Common Core State Standards (CCSS). Illinois is one of 11 governing states in the PARCC, with participation in the Advisory Committee on College Readiness (ACCR), a group of higher education experts helping to develop assessments that measure readiness for first-year, credit-bearing college work. A main goal of the common core state standards is to ensure that high school graduates have acquired the knowledge and skills needed to succeed in college and careers.

Table 39 on the next page displays the percentages of students meeting or exceeding proficiency standards on the English Language Arts (ELA) and Mathematics portions of the PARCC exam in 2015. Three high schools, Aldon-Hebron, Johnsburg, and Huntley exceeded the state average on the ELA exam. Only Woodstock High School exceeded the state average on the math portion. In 2016 a different pattern emerged with McHenry East High School, Richmond-Burton High School and Alden-Hebron High School surpassing the statewide benchmark for ELA. Richmond-Burton High School and Alden-Hebron High School surpassed the statewide benchmark for math. While these numbers are low compared to the statewide average, contributing factors most likely include the switch from ACT to PARCC assessment methodologies. The ACT was discontinued in the 2015 school year. The 2017 school year will be replacing the PARCC in favor of the SAT exam in high schools only<sup>34</sup>.

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<sup>34</sup> Illinois State Board of Education, SAT Exam Will Replace PARCC Assessment for High School Students During the 2016-17 School Year, July 11, 2016. <http://www.isbe.net/news/2016/july11.htm>.

Table 39: High School PARCC Scores	Year	ELA	Math	Low-Income ELA	Low-Income Math
Alden-Hebron High School	2015	40.6	8.9	N/A	N/A
	2016	70.0	44.4	N/A	N/A
Cary Grove Community High School	2015	31.7	0.6	15.3	0.0
	2016	27.1	13.8	10.6	3.8
Crystal Lake Central High School	2015	33.0	0.0	11.1	0.0
	2016	33.0	2.5	14.6	1.7
Crystal Lake South High School	2015	30.8	3.2	25.4	0.0
	2016	31.5	3.3	10.2	0.0
Harvard High School	2015	2.8	6.3	2.8	6.9
	2016	11.8	12.8	9.4	13.1
Huntley High School	2015	50.4	20.3	4.9	0.0
	2016	29.4	24.9	20.6	17.4
Johnsburg High School	2015	45.4	10.9	20.7	10.5
	2016	32.1	8.1	28.9	2.9
Marengo High School	2015	11.5	15.6	1.8	7.0
	2016	15.7	16.5	7.0	9.1
McHenry East High School	2015	20.6	13.5	16.4	10.6
	2016	39.6	12.7	27.1	7.1
McHenry High School-West Campus	2015	26.0	16.6	22.9	14.0
	2016	29.2	24.0	17.0	14.9
Prairie Ridge High School	2015	34.3	3.1	19.4	3.8
	2016	30.7	10.3	29.4	22.2
Richmond-Burton High School	2015	9.7	15.3	7.1	0.0
	2016	58.9	33.1	42.9	13.0
Woodstock High School	2015	32.3	31.9	31.1	13.5
	2016	30.3	11.2	17.1	2.4
Woodstock North High School	2015	22.5	25.4	16.3	17.4
	2016	20.3	4.3	15.9	5.1
<b>State Average</b>	<b>2015</b>	<b>37.7</b>	<b>28.2</b>	<b>23.8</b>	<b>15.6</b>
	<b>2016</b>	<b>36.2</b>	<b>30.4</b>	<b>21.7</b>	<b>17.0</b>

Source: Illinois State Board of Education, Report Card Data.

Within Illinois, a key example of this effort is the cooperation amongst the various levels of education – state and higher education – in working to develop and implement the Common Core State Standards so that students can be as prepared as possible to succeed in postsecondary education.

### **Resource Availability**

Funding problems did not begin with the current stalemate over the state budget. A trend of state disinvestment in higher education has been evident even in good economic times<sup>35</sup>, and community colleges have been most affected because of their reliance on taxpayer support. A 2010 report from the American Association of Community Colleges<sup>36</sup> points out that while community colleges serve 43 percent of all undergraduates (54 percent of all undergraduates in public higher education), they receive only 27 percent of total federal, state, and local higher education revenues.

Complicating this picture is the proliferation of higher education providers, both place-based and online. Appendix E lists the many public and proprietary institutions within a 20-mile radius of MCC. In the absence of relevant and easy to use consumer information, traditional and nontraditional students alike may be choosing educational providers that do not meet their learning needs.

The triple whammy of declining public funding, increased student demand, and greater competition is affecting community colleges throughout the nation. Between 2008 and 2010, credit enrollment in community colleges surged by 17 percent<sup>37</sup>, and at McHenry County College, the spring 2010 enrollment required administrators to establish new strategies to

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<sup>35</sup> Policy Research Institute. (2010). How to fix a broken system: Funding public higher education and making it more productive: Setting a pathway to greater productivity within new funding realities. Princeton, N.J.: New Jersey Association of State Colleges and Universities, 2010. Retrieved from <http://www.njascu.org/PolicyBriefApril2010.pdf>

<sup>36</sup> Mullin, C. (2010). Doing more with less: The inequitable funding of community colleges. (AACC Policy Brief 2010–03PBL.) Washington, D.C.: American Association of Community Colleges. Retrieved from [http://www.aacc.nche.edu/Publications/Briefs/Documents/doingmore\\_09082010.pdf](http://www.aacc.nche.edu/Publications/Briefs/Documents/doingmore_09082010.pdf)

<sup>37</sup> Mullin, C., and Phillippe, K. (2009). Community college enrollment surge: An analysis of estimated fall 2009 headcount enrollments at community colleges. (Policy Brief 2009–01 PBL.) Washington, D.C.: American Association of Community Colleges.

accommodate the surging enrollment.<sup>38</sup> Despite these financial woes, President Obama asked community colleges to produce an additional 5 million program completers by 2020, an approximate 50% increase over current levels.<sup>39</sup>

Community colleges are highly dependent on state funding since, unlike four-year public institutions, they do not have diversified revenue sources such as hospitals, endowments, or research grants. Currently the college has the ability to increase the amount of tuition and fees charged to students. The State limits the amount that can be charged to students to 33% of their per capita cost per hour, and MCC currently utilizes 27% of the allowed percentage.<sup>40</sup> Choosing to utilize this revenue source, when local real estate values have dropped and property tax revenues are capped, may be necessary to respond to the demands and changes of the county.

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<sup>38</sup> Hancock, B. R. (2012). Perceptions of Illinois community college administrators on the impact of the U.S. economic recession and state financial pressures on programs for adults. (Doctoral dissertation, Southern Illinois University, Carbondale). Retrieved from <http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1381&context=dissertations>

<sup>39</sup> Obama, B. (2009). *Remarks by the President on the American Graduation Initiative*. Washington, D.C.: The White House, Office of the Press Secretary, July 14, 2009.

<sup>40</sup> McHenry County College. (2012). Comprehensive annual financial report.

## **Appendices**

**Appendix A: Burning Glass Data (Job Listings)**

Certifications	Job Postings
CDL CLASS A	290
REGISTERED NURSE	120
FIRST AID CPR AED	78
COMMERCIAL DRIVER'S LICENSE	48
CERTIFIED PUBLIC ACCOUNTANT (CPA)	31
AUTOMOTIVE SERVICE EXCELLENCE (ASE) CERTIFICATION	25
FORKLIFT OPERATOR CERTIFICATION	23
AMERICAN SPEECH - LANGUAGE HEARING ASSOCIATION	22
CERTIFIED NURSING ASSISTANT	22
REAL ESTATE CERTIFICATION	21
CERTIFIED A+ TECHNICIAN	17
CERTIFIED OCCUPATIONAL THERAPY ASSISTANT (COTA)	14
ADVANCED CARDIAC LIFE SUPPORT (ACLS) CERTIFICATION	13
SECURITY GUARD CERTIFICATION	13
PROJECT MANAGEMENT CERTIFICATION (E.G. PMP)	12
CERTIFIED MEDICAL ASSISTANT	11
CRITICAL CARE REGISTERED NURSE (CCRN)	10
MORTGAGE LICENSE	10
ALCOHOL SERVER CERTIFICATION	9
HOME HEALTH AIDE	9
INSURANCE LICENSE	9
SERVSAFE	9
SECURITY CLEARANCE	8
TEACHING LICENSE	8
BASIC CARDIAC LIFE SUPPORT CERTIFICATION	7
SERIES 6	7
SERIES 7	7
ACCIDENT HEALTH AND LIFE (INSURANCE)	6
NURSE PRACTITIONER	6
REGISTERED HEALTH INFORMATION TECHNICIAN	6
AGGREGATE TECHNICIAN CERTIFICATION	5
AMERICAN HEART ASSOCIATION CERTIFICATE	5
BOARD CERTIFIED/BOARD ELIGIBLE	5
CERTIFIED PROFESSIONAL CODER	5
CHARTERED FINANCIAL ANALYST (CFA)	5
ENVIRONMENTAL PROTECTION AGENCY CERTIFICATION	5

FOOD SERVICE SANITATION CERTIFICATION	5
LEARNING BEHAVIORAL SPECIALIST I	5
MINE SAFETY CERTIFICATE	5
PATIENT CARE TECHNICIAN	5
REGISTERED DIETITIAN	5
REGISTERED HEALTH INFORMATION ADMINISTRATOR	5
ADVANCED PRACTICE NURSE	4
CASH HANDLING CERTIFICATION	4
CERTIFIED AMBULATORY PERIANESTHESIA NURSE	4
CERTIFIED PROFESSIONAL CODER-HOSPITAL OUTPATIENT	4
CERTIFIED TEACHER	4
COSMETOLOGY LICENSE	4
EMERGENCY MEDICAL TECHNICIAN (EMT)	4
HAZARDOUS MATERIALS CERTIFICATION	4
IPMA CERTIFIED SENIOR PROJECT MANAGER	4
VETERINARY TECHNICIAN	4
AMERICAN OCCUPATIONAL THERAPY ASSOCIATION (AOTA)	3
AMERICAN PHYSICAL THERAPY ASSOCIATION (APTA)	3
AMERICAN REGISTRY OF RADIOLOGIC TECHNOLOGISTS (ARRT)	3
AMERICAN SOCIETY FOR QUALITY (ASQ) CERTIFICATION	3
CDL CLASS C	3
CERTIFIED QUALITY AUDITOR	3
CERTIFIED QUALITY ENGINEER	3
CERTIFIED REHABILITATION COUNSELOR	3
ELECTRICIAN CERTIFICATION	3
LICENSED VOCATIONAL NURSE (LVN)	3
LIFE INSURANCE LICENSE	3
MANAGEMENT AND SUPERVISION	3
MICROSOFT CERTIFIED PROFESSIONAL (MCP)	3
MICROSOFT CERTIFIED SOLUTIONS EXPERT (MCSE)	3
NETWORK+ CERTIFIED	3
SIX SIGMA BLACK BELT	3
SIX SIGMA CERTIFICATION	3
TEACHING CERTIFICATE	3
ADVANCED REGISTERED NURSE PRACTITIONER	2
AIR BRAKE CERTIFIED	2
CERTIFIED FLUID POWER SPECIALIST	2
CERTIFIED HIPAA PROFESSIONAL	2
CERTIFIED VETERINARY TECHNICIAN	2

CLINICAL MEDICAL ASSISTANT	2
EMERGENCY MEDICINE	2
INSTITUTE OF INTERNAL AUDITORS (IIA)	2
NEONATAL RESUSCITATION	2
PARALEGAL CERTIFICATION	2
PHLEBOTOMY CERTIFICATION	2
PROPERTY AND CASUALTY LICENSE	2
PSYCHOLOGIST LICENSE	2
QUALITY MANAGEMENT CERTIFICATION (E.G. CMQ)	2
WELDING CERTIFICATION (E.G. AWS CERTIFIED WELDER)	2
AMERICAN REGISTRY FOR DIAGNOSTIC MEDICAL SONOGRAPHY (ARDMS)	1
AMERICAN SOCIETY FOR CLINICAL PATHOLOGY (ASCP) CERTIFICATION	1
APICS (AMERICAN PRODUCTION AND INVENTORY CONTROL SOCIETY) CERTIFICATION	1
APPLE CERTIFIED MACINTOSH TECHNICIAN	1
ASAP CERTIFIED	1
BELAY	1
BOARD CERTIFIED BEHAVIOR ANALYST	1
BOC CERTIFIED	1
CERTIFIED ALCOHOL AND DRUG ABUSE COUNSELOR	1
CERTIFIED CODING SPECIALIST	1
CERTIFIED DENTAL ASSISTANT	1
CERTIFIED FINANCIAL PLANNER	1
CERTIFIED HOSPICE AND PALLIATIVE NURSE	1
CERTIFIED INFORMATION SYSTEM SECURITY PROFESSIONAL	1
CERTIFIED INFORMATION SYSTEMS SECURITY PROFESSIONAL (CISSP)	1
CERTIFIED LEAD AUDITOR	1
CERTIFIED MOLD MAKER	1
CERTIFIED OFFICIAL	1
CERTIFIED PEDIATRIC NURSE	1
CERTIFIED PHARMACY TECHNICIAN	1
CERTIFIED PLAYGROUND SAFETY INSPECTOR	1
CERTIFIED SAFETY PROFESSIONAL	1
CERTIFIED SURGICAL TECHNOLOGIST	1
CHARTERED FINANCIAL CONSULTANT	1
CHARTERED LIFE UNDERWRITER (CLU)	1
CHARTERED PROPERTY CASUALTY UNDERWRITER	1
CISCO CERTIFIED NETWORK ASSOCIATE	1
ENGINEER IN TRAINING CERTIFICATION	1
FAMILY MEDICINE	1



FOOD SERVICE CERTIFICATION (E.G. FMP)	1
FSSC 22000	1
GERIATRIC NURSING ASSISTANT	1
GROUP EXERCISE INSTRUCTOR	1
HOME CARE CERTIFICATE	1
HONORABLE DISCHARGE	1
HVAC TECHNICIAN CERTIFICATION (E.G. EPA 608)	1
LEADERSHIP CERTIFICATION	1
LICENSED BARBER	1
LICENSED MORTGAGE LOAN ORIGINATOR	1
LICENSED NURSING ASSISTANT	1
MASSAGE THERAPIST CERTIFICATION	1
MEDICAL TERMINOLOGY CERTIFICATION	1
MIXED MARTIAL ARTS	1
NATIONAL BOARD FOR CERTIFICATION IN OCCUPATIONAL THERAPY (NBCOT)	1
NURSE-MIDWIFE	1
NURSING HOME ADMINISTRATOR	1
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION CERTIFICATION	1
PEDIATRIC ADVANCED LIFE SUPPORT (PALS) CERTIFICATION	1
PERSONAL FITNESS TRAINER CERTIFICATION	1
RADIOGRAPHY CERTIFICATION	1
REGISTERED DIAGNOSTIC CARDIAC SONOGRAPHER	1
REGISTERED DIAGNOSTIC MEDICAL SONOGRAPHER	1
REGISTERED VASCULAR TECHNOLOGIST	1
REGULATORY AFFAIRS CERTIFICATION	1
ROAD TEST	1
SIX SIGMA GREEN BELT	1
SPECIAL EDUCATION CERTIFICATION	1
TEACHERS OF ENGLISH TO SPEAKERS OF OTHER LANGUAGES (TESOL)	1

Baseline Skills	Job Postings
Communication Skills	748
Customer Service	505
Writing	462
Physical Demand	401
Organizational Skills	399
Computer Skills	335
Microsoft Excel	291

Problem Solving	280
Detail-Oriented	268
Supervisory Skills	253
English	234
Team Work/ Collaboration	218
Microsoft Office	212
Planning	184
Building Effective Relationships	176
Troubleshooting	157
Mathematics	150
Multi-Tasking	139
Time Management	129
Microsoft Word	125
Listening	122
Quality Assurance and Control	120
Creativity	115
Research	110
Bilingual	87
Project Management	87
Energetic	85
Leadership	80
Analytical Skills	75
Telephone Skills	75
Preventive Maintenance	73
Microsoft Powerpoint	69
Work Area Maintenance	68
Spanish	66
Meeting Deadlines	64
Typing	63
Self-Starter	58
Mentoring	49
Decision Making	48
Positive Disposition	44
Word Processing	44
Cost Control	40
Presentation Skills	35
Performance Analysis	31
Conflict Management	30

<b>Project Planning and Development Skills</b>	30
<b>Articulate</b>	29
<b>Initiative</b>	29
<b>Prioritizing Tasks</b>	27
<b>Critical Thinking</b>	24
<b>Microsoft Outlook</b>	23
<b>Management</b>	22
<b>Microsoft Access</b>	22
<b>Microsoft Windows</b>	20
<b>Self-Motivation</b>	19
<b>Editing</b>	17
<b>Negotiation Skills</b>	16
<b>General Office Duties</b>	15
<b>Strategic Planning</b>	15
<b>Preparing Reports</b>	14
<b>Technical Assistance</b>	14
<b>Creative Problem Solving</b>	13
<b>Team Building</b>	13
<b>Team Management</b>	13
<b>Needs Assessment</b>	11
<b>Secretarial Skills</b>	11
<b>Change Management</b>	10
<b>Cost Estimation</b>	8
<b>Microsoft Project</b>	8
<b>Persuasion</b>	8
<b>French</b>	7
<b>Clerical Duties</b>	6
<b>Quick Learner</b>	6
<b>Business Communications</b>	4
<b>Progress Reports</b>	4
<b>Basic Internet Skills</b>	3
<b>English as a Second Language</b>	3
<b>Office Skills</b>	3
<b>Service Improvement</b>	3
<b>Tool Selection</b>	3
<b>Korean</b>	2
<b>Online Research</b>	2
<b>Chinese</b>	1

Companionship	1
German	1
Progress Documentation	1
Range of Motion	1

Specialized Skills	Job Postings
Customer Service	505
Sales	504
Retail Setting	313
Scheduling	277
Supervisory Skills	253
Merchandising	209
Customer Contact	205
Store Management	200
Inspection	198
Repair	197
Budgeting	176
Cleaning	168
Product Sales	153
Mathematics	150
Labeling	126
Description and Demonstration of Products	125
Listening	122
Product Knowledge	119
Teaching	119
Sales Goals	114
Retail Sales	107
Packaging	104
Staff Management	96
Loss Prevention	92
Cardiopulmonary Resuscitation (CPR)	91
Accounting	89
Project Management	87
Data Entry	78
Forklift Operation	78
Patient Care	74
Cash Handling	71
Scanners	67

Sales Management	65
Business Development	63
Spreadsheets	63
Cooking	62
Machinery	58
Treatment Planning	58
Current Good Manufacturing Practices (CGMP)	57
Technical Support	57
Validation	57
Product Development	55
Food Safety	53
SAP	53
Store Operations	52
Customer Billing	50
Instruction	49
Product Location	49
Visual Merchandising	49
Calculation	48
Purchasing	48
Therapy	48
Customer Checkout	44
Inventory Management	44
Word Processing	44
Administrative Support	42
Occupational Health and Safety	41
Appointment Setting	40
Cost Control	40
Enterprise Resource Planning (ERP)	40
Retail Management	40
Client Base Retention	39
Sales Planning	39
Training Programs	39
Cross Sell	38
Expense Reports	38
Process Improvement	38
Speech Language Pathology	38
New Product Development	37
Plumbing	37
Record Keeping	37

<b>Computer Aided Drafting/Design (CAD)</b>	36
<b>Hand Tools</b>	36
<b>Rehabilitation</b>	36
<b>Asset Protection</b>	35
<b>Chemistry</b>	35
<b>Performance Appraisals</b>	35
<b>Prospective Clients</b>	34
<b>Operations Management</b>	32
<b>Performance Management</b>	32
<b>Administrative Functions</b>	31
<b>Brand Awareness Generation</b>	31
<b>Financial Analysis</b>	31
<b>Conflict Management</b>	30
<b>Financial Reporting</b>	30
<b>Seminars</b>	30
<b>Good Manufacturing Practices (GMP)</b>	29
<b>Guest Services</b>	29
<b>Marketing</b>	29
<b>Pathology</b>	29
<b>Schematic Diagrams</b>	29
<b>Database Software</b>	28
<b>Early Childhood Education</b>	28
<b>Patient/Family Education and Instruction</b>	28
<b>Physical Therapy</b>	28
<b>Inside Sales</b>	27
<b>Key Performance Indicators</b>	27
<b>Onboarding</b>	27
<b>Cash Register Operation</b>	26
<b>HIPAA</b>	26
<b>Infection Control</b>	26
<b>Inventory Control</b>	26
<b>Occupational Therapy</b>	26
<b>Shipping and Receiving</b>	26
<b>Consumer Electronics</b>	25
<b>Inventory System</b>	25
<b>Welding</b>	25
<b>Costing</b>	24
<b>Generally Accepted Accounting Principles (GAAP)</b>	24
<b>International Traffic in Arms Regulations (ITAR)</b>	24

Inventory Maintenance	24
Machine Operation	24
Medical Coding	24
Outside Sales	24
Software Development	24
Store Merchandising	24
Total Rewards Strategy	24
Business Process	23
Caregiving	23
Contract Management	23
Customer Accounts	23
Export Compliance	23
Handtrucks	23
Legal Compliance	23
Long-Term Care	23
Mechanical Engineering	23
Six Sigma	23
Food Preparation	22
Microsoft Access	22
Oracle	22
Power Tools	22
Balance Sheet	21
Child Care	21
Cost Accounting	21
Internal Auditing	21
Lean Manufacturing	21
Nationwide Mortgage Licensing System (NMLS)	21
Workshops	21
Account Reconciliation	20
Calibration	20
Critical Care	20
Data Collection	20
Financial Statements	20
Home Health	20
Mailing	20
Month-End Close Processes	20
Product Management	20
Restaurant Management	20
SQL	20

Child Development	19
Forecasting	19
Grinders	19
Hardware Experience	19
Manufacturing Processes	19
Prospecting	19
Report Writing	19
Social Media	19
Battery Testing and Installation	18
Business Planning	18
Carpentry	18
Food Service Experience	18
Medical Device	18
Optimization	18
Point of Sale System	18
Sales Support	18
Auto Repair	17
Brand Loyalty	17
Customer Relationship Marketing	17
Electrical Engineering	17
Order Entry	17
Telemarketing	17
Training Materials	17
Wiring	17
Cash Control	16
Customer Relationship Management (CRM)	16
HVAC	16
Insurance Underwriting	16
Law Enforcement or Criminal Justice Experience	16
Negotiation Skills	16
Neonatal Intensive Care Unit (NICU)	16
Pediatrics	16
Product Design	16
Programmable Logic Controller (PLC) Programming	16
Risk Management	16
Root Cause Analysis	16
Salesforce	16
Technical Writing / Editing	16
Business Analysis	15



Calculator	15
Electrical Systems	15
Employee Training	15
General Office Duties	15
Handling of Crisis or Emergency Situations	15
Insurance Sales	15
Logistics	15
Machining	15
Medication Administration	15
Microsoft C#	15
Post Anesthesia Care Unit (PACU)	15
Processing Item Returns	15

Occupations	Job Postings
Heavy and Tractor-Trailer Truck Drivers (53-3032)	481
Retail Salespersons (41-2031)	207
Registered Nurses (29-1141)	148
First-Line Supervisors of Retail Sales Workers (41-1011)	110
Customer Service Representatives (43-4051)	107
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products (41-4012)	89
Speech-Language Pathologists (29-1127)	76
Combined Food Preparation and Serving Workers, Including Fast Food (35-3021)	68
First-Line Supervisors of Food Preparation and Serving Workers (35-1012)	58
Production Workers, All Other (51-9199)	51
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	46
Managers, All Other (11-9199)	46
Maintenance and Repair Workers, General (49-9071)	45
Merchandise Displayers and Window Trimmers (27-1026)	41
Occupational Therapists (29-1122)	40
Physical Therapists (29-1123)	40
Security Guards (33-9032)	40
Accountants and Auditors (13-2011)	38
Preschool Teachers, Except Special Education (25-2011)	38
Stock Clerks and Order Fillers (43-5081)	37
Sales Managers (11-2022)	36
Demonstrators and Product Promoters (41-9011)	32
Securities, Commodities, and Financial Services Sales Agents (41-3031)	31

Cashiers (41-2011)	30
Automotive and Watercraft Service Attendants (53-6031)	28
Financial Managers (11-3031)	28
Human Resources Specialists (13-1071)	27
Nursing Assistants (31-1014)	27
Team Assemblers (51-2092)	27
Computer Occupations, All Other (15-1199)	26
Medical and Health Services Managers (11-9111)	26
Bookkeeping, Accounting, and Auditing Clerks (43-3031)	25
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	23
Computer User Support Specialists (15-1151)	21
First-Line Supervisors of Office and Administrative Support Workers (43-1011)	21
General and Operations Managers (11-1021)	21
Licensed Practical and Licensed Vocational Nurses (29-2061)	21
Teacher Assistants (25-9041)	21
Market Research Analysts and Marketing Specialists (13-1161)	20
Software Developers, Applications (15-1132)	20
Medical Records and Health Information Technicians (29-2071)	19
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive (43-6014)	19
Industrial Production Managers (11-3051)	18
Insurance Sales Agents (41-3021)	18
Financial Analysts (13-2051)	17
First-Line Supervisors of Production and Operating Workers (51-1011)	17
Food Service Managers (11-9051)	17
Life, Physical, and Social Science Technicians, All Other (19-4099)	17
Marketing Managers (11-2021)	17
Tellers (43-3071)	17
Janitors and Cleaners, Except Maids and Housekeeping Cleaners (37-2011)	16
Special Education Teachers, Secondary School (25-2054)	16
Driver/Sales Workers (53-3031)	15
Electricians (47-2111)	15
Butchers and Meat Cutters (51-3021)	14
Secondary School Teachers, Except Special and Career/Technical Education (25-2031)	14
Computer Systems Analysts (15-1121)	13
Industrial Truck and Tractor Operators (53-7051)	13
Light Truck or Delivery Services Drivers (53-3033)	13
Clinical, Counseling, and School Psychologists (19-3031)	12
Coaches and Scouts (27-2022)	12
Electrical Engineers (17-2071)	12

First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)	12
Medical Assistants (31-9092)	12
Occupational Therapy Assistants (31-2011)	12
Receptionists and Information Clerks (43-4171)	12
Chemists (19-2031)	11
Cooks, Restaurant (35-2014)	11
Loan Officers (13-2072)	11
Management Analysts (13-1111)	11
Middle School Teachers, Except Special and Career/Technical Education (25-2022)	11
Physicians and Surgeons, All Other (29-1069)	11
Protective Service Workers, All Other (33-9099)	11
Real Estate Sales Agents (41-9022)	11
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)	11
Special Education Teachers, All Other (25-2059)	11
Claims Adjusters, Examiners, and Investigators (13-1031)	10
Elementary School Teachers, Except Special Education (25-2021)	10
Engineers, All Other (17-2199)	10
Office Clerks, General (43-9061)	10
Bakers (51-3011)	9
Data Entry Keyers (43-9021)	9
Nonfarm Animal Caretakers (39-2021)	9
Nurse Practitioners (29-1171)	9
Office and Administrative Support Workers, All Other (43-9199)	9
Personal Care Aides (39-9021)	9
Printing Press Operators (51-5112)	9
Production, Planning, and Expediting Clerks (43-5061)	9
Purchasing Agents, Except Wholesale, Retail, and Farm Products (13-1023)	9
Compensation, Benefits, and Job Analysis Specialists (13-1141)	8
Computer Network Architects (15-1143)	8
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (51-4031)	8
Maids and Housekeeping Cleaners (37-2012)	8
Packers and Packagers, Hand (53-7064)	8
Architectural and Engineering Managers (11-9041)	7
Compliance Officers (13-1041)	7
Computer Programmers (15-1131)	7
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders (51-9021)	7
Education Administrators, Elementary and Secondary School (11-9032)	7
Flight Attendants (53-2031)	7

Hairdressers, Hairstylists, and Cosmetologists (39-5012)	7
Helpers--Production Workers (51-9198)	7
Industrial Engineers (17-2112)	7
Medical Secretaries (43-6013)	7
Shipping, Receiving, and Traffic Clerks (43-5071)	7
Veterinarians (29-1131)	7
Commercial and Industrial Designers (27-1021)	6
Dental Assistants (31-9091)	6
Electrical And Electronics Engineering Technicians (17-3023)	6
Engineering Technicians, Except Drafters, All Other (17-3029)	6
Fitness Trainers and Aerobics Instructors (39-9031)	6
Legal Secretaries (43-6012)	6
Medical and Clinical Laboratory Technicians (29-2012)	6
Parts Salespersons (41-2022)	6
Physical Therapist Assistants (31-2021)	6
Teachers And Instructors, All Other, Except Substitute Teachers (25-3099)	6
Chemical Engineers (17-2041)	5
Childcare Workers (39-9011)	5
Computer and Information Systems Managers (11-3021)	5
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop (35-3022)	5
Educational, Guidance, School, and Vocational Counselors (21-1012)	5
First-Line Supervisors of Non-Retail Sales Workers (41-1012)	5
Mechanical Drafters (17-3013)	5
Mechanical Engineers (17-2141)	5
Personal Financial Advisors (13-2052)	5
Sales Representatives, Services, All Other (41-3099)	5
Training and Development Specialists (13-1151)	5
Administrative Services Managers (11-3011)	4
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers (51-2011)	4
Automotive Body and Related Repairers (49-3021)	4
Automotive Service Technicians and Mechanics (49-3023)	4
Carpenters (47-2031)	4
Construction Managers (11-9021)	4
Dentists, General (29-1021)	4
Dishwashers (35-9021)	4
First-Line Supervisors of Personal Service Workers (39-1021)	4
Graphic Designers (27-1024)	4
Home Health Aides (31-1011)	4
Instructional Coordinators (25-9031)	4

Logisticians (13-1081)	4
Machinists (51-4041)	4
Medical Transcriptionists (31-9094)	4
Postal Service Clerks (43-5051)	4
Property, Real Estate, and Community Association Managers (11-9141)	4
Radiologic Technologists (29-2034)	4
Tire Builders (51-9197)	4
Transportation, Storage, and Distribution Managers (11-3071)	4
Web Developers (15-1134)	4
Weighers, Measurers, Checkers, and Samplers, Recordkeeping (43-5111)	4
Business Operations Specialists, All Other (13-1199)	3
Child, Family, and School Social Workers (21-1021)	3
Clergy (21-2011)	3
Computer-Controlled Machine Tool Operators, Metal and Plastic (51-4011)	3
Construction Laborers (47-2061)	3
Cost Estimators (13-1051)	3
Database Administrators (15-1141)	3
Designers, All Other (27-1029)	3
Dietitians and Nutritionists (29-1031)	3
Emergency Medical Technicians and Paramedics (29-2041)	3
Geological and Petroleum Technicians (19-4041)	3
Health Technologists and Technicians, All Other (29-2099)	3
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	3
Helpers--Installation, Maintenance, and Repair Workers (49-9098)	3
Human Resources Assistants, Except Payroll and Timekeeping (43-4161)	3
Information Security Analysts (15-1122)	3
Interior Designers (27-1025)	3
Loan Interviewers and Clerks (43-4131)	3
Pharmacy Technicians (29-2052)	3
Physician Assistants (29-1071)	3
Police and Sheriff's Patrol Officers (33-3051)	3
Private Detectives and Investigators (33-9021)	3
Public Relations Specialists (27-3031)	3
Reporters and Correspondents (27-3022)	3
Security and Fire Alarm Systems Installers (49-2098)	3
Social and Human Service Assistants (21-1093)	3
Telecommunications Equipment Installers and Repairers, Except Line Installers (49-2022)	3
Telecommunications Line Installers and Repairers (49-9052)	3
Waiters and Waitresses (35-3031)	3

Amusement and Recreation Attendants (39-3091)	2
Animal Trainers (39-2011)	2
Architects, Except Landscape and Naval (17-1011)	2
Bartenders (35-3011)	2
Bill and Account Collectors (43-3011)	2
Bus Drivers, School or Special Client (53-3022)	2
Bus and Truck Mechanics and Diesel Engine Specialists (49-3031)	2
Cardiovascular Technologists and Technicians (29-2031)	2
Chefs and Head Cooks (35-1011)	2
Editors (27-3041)	2
Education Administrators, Postsecondary (11-9033)	2
Electrical and Electronic Equipment Assemblers (51-2022)	2
Environmental Science and Protection Technicians, Including Health (19-4091)	2
Executive Secretaries and Executive Administrative Assistants (43-6011)	2
Family and General Practitioners (29-1062)	2
Financial Examiners (13-2061)	2
Food Preparation Workers (35-2021)	2
Hazardous Materials Removal Workers (47-4041)	2
Healthcare Support Workers, All Other (31-9099)	2
Information and Record Clerks, All Other (43-4199)	2
Internists, General (29-1063)	2
Landscaping and Groundskeeping Workers (37-3011)	2

Industries	Job Postings
General Freight Trucking (4841)	272
Restaurants and Other Eating Places (7225)	138
Elementary and Secondary Schools (6111)	110
Insurance Carriers (5241)	104
Offices of Other Health Practitioners (6213)	75
Depository Credit Intermediation (5221)	69
Management, Scientific, and Technical Consulting Services (5416)	61
Business Support Services (5614)	58
Department Stores (4521)	54
General Medical and Surgical Hospitals (6221)	53
Specialized Freight Trucking (4842)	50
Building Material and Supplies Dealers (4441)	49
Investigation and Security Services (5616)	48

<b>Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (3345)</b>	39
<b>Automotive Parts, Accessories, and Tire Stores (4413)</b>	38
<b>Child Day Care Services (6244)</b>	36
<b>Office Supplies, Stationery, and Gift Stores (4532)</b>	32
<b>Other Amusement and Recreation Industries (7139)</b>	31
<b>Colleges, Universities, and Professional Schools (6113)</b>	30
<b>Sporting Goods, Hobby, and Musical Instrument Stores (4511)</b>	30
<b>Clothing Stores (4481)</b>	27
<b>Electronics and Appliance Stores (4431)</b>	24
<b>Advertising, Public Relations, and Related Services (5418)</b>	23
<b>Other Miscellaneous Store Retailers (4539)</b>	22
<b>Other General Merchandise Stores (4529)</b>	20
<b>Other Professional, Scientific, and Technical Services (5419)</b>	20
<b>Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly (6233)</b>	19
<b>Grocery Stores (4451)</b>	19
<b>Building Equipment Contractors (2382)</b>	18
<b>Agencies, Brokerages, and Other Insurance Related Activities (5242)</b>	17
<b>Home Health Care Services (6216)</b>	16
<b>Employment Services (5613)</b>	14
<b>Nondepository Credit Intermediation (5222)</b>	14
<b>Offices of Physicians (6211)</b>	14
<b>Other Financial Investment Activities (5239)</b>	14
<b>Special Food Services (7223)</b>	13
<b>Cable and Other Subscription Programming (5152)</b>	12
<b>Automotive Equipment Rental and Leasing (5321)</b>	10
<b>Health and Personal Care Stores (4461)</b>	10
<b>Grocery and Related Product Merchant Wholesalers (4244)</b>	9
<b>Residential Building Construction (2361)</b>	9
<b>Services to Buildings and Dwellings (5617)</b>	9
<b>Other General Purpose Machinery Manufacturing (3339)</b>	8
<b>Scheduled Air Transportation (4811)</b>	8
<b>Wireless Telecommunications Carriers (except Satellite) (5172)</b>	8
<b>Agriculture, Construction, and Mining Machinery Manufacturing (3331)</b>	7
<b>Automobile Dealers (4411)</b>	7
<b>Automotive Repair and Maintenance (8111)</b>	7
<b>Furniture Stores (4421)</b>	7
<b>Newspaper, Periodical, Book, and Directory Publishers (5111)</b>	7
<b>Oil and Gas Extraction (2111)</b>	7

Other Personal Services (8129)	7
Scientific Research and Development Services (5417)	7
Architectural, Engineering, and Related Services (5413)	6
Computer and Peripheral Equipment Manufacturing (3341)	6
Nursing Care Facilities (Skilled Nursing Facilities) (6231)	6
Offices of Dentists (6212)	6
Personal Care Services (8121)	6
Urban Transit Systems (4851)	6
Warehousing and Storage (4931)	6
Activities Related to Real Estate (5313)	5
Book Stores and News Dealers (4512)	5
Consumer Goods Rental (5322)	5
Other Ambulatory Health Care Services (6219)	5
Specialty (except Psychiatric and Substance Abuse) Hospitals (6223)	5
Civic and Social Organizations (8134)	4
Individual and Family Services (6241)	4
Legal Services (5411)	4
Postal Service (4911)	4
Shoe Stores (4482)	4
Dairy Product Manufacturing (3115)	3
Executive, Legislative, and Other General Government Support (9211)	3
Foundation, Structure, and Building Exterior Contractors (2381)	3
Grain and Oilseed Milling (3112)	3
Home Furnishings Stores (4422)	3
Other Investment Pools and Funds (5259)	3
Other Miscellaneous Manufacturing (3399)	3
Pharmaceutical and Medicine Manufacturing (3254)	3
Religious Organizations (8131)	3
Software Publishers (5112)	3
Traveler Accommodation (7211)	3
Administration of Human Resource Programs (9231)	2
Basic Chemical Manufacturing (3251)	2
Data Processing, Hosting, and Related Services (5182)	2
Freight Transportation Arrangement (4885)	2
Jewelry, Luggage, and Leather Goods Stores (4483)	2
Machinery, Equipment, and Supplies Merchant Wholesalers (4238)	2
Management of Companies and Enterprises (5511)	2
Metalworking Machinery Manufacturing (3335)	2
Nonresidential Building Construction (2362)	2



Offices of Real Estate Agents and Brokers (5312)	2
Other Food Manufacturing (3119)	2
Other Furniture Related Product Manufacturing (3379)	2
Paint, Coating, and Adhesive Manufacturing (3255)	2
Plastics Product Manufacturing (3261)	2
Printing and Related Support Activities (3231)	2
Securities and Commodity Contracts Intermediation and Brokerage (5231)	2
Sound Recording Industries (5122)	2
Waste Collection (5621)	2
Waste Treatment and Disposal (5622)	2
Wired Telecommunications Carriers (5171)	2
Architectural and Structural Metals Manufacturing (3323)	1
Beverage Manufacturing (3121)	1
Cement and Concrete Product Manufacturing (3273)	1
Charter Bus Industry (4855)	1
Computer Systems Design and Related Services (5415)	1
Converted Paper Product Manufacturing (3222)	1
Couriers and Express Delivery Services (4921)	1
Death Care Services (8122)	1
Drinking Places (Alcoholic Beverages) (7224)	1
Drugs and Druggists' Sundries Merchant Wholesalers (4242)	1
Junior Colleges (6112)	1
Justice, Public Order, and Safety Activities (9221)	1
Lessors of Real Estate (5311)	1
National Security and International Affairs (9281)	1
Natural Gas Distribution (2212)	1
Other Schools and Instruction (6116)	1
Outpatient Care Centers (6214)	1
Performing Arts Companies (7111)	1
Promoters of Performing Arts, Sports, and Similar Events (7113)	1
Rail Transportation (4821)	1
Soap, Cleaning Compound, and Toilet Preparation Manufacturing (3256)	1
Specialized Design Services (5414)	1
Specialty Food Stores (4452)	1
Sugar and Confectionery Product Manufacturing (3113)	1
Used Merchandise Stores (4533)	1
Vocational Rehabilitation Services (6243)	1

Employers	Job Postings
Celadon Trucking Services	87
North Chicago Marketing, Inc	40
Forsythe Solutions Group Incorporated	36
United States Xpress Enterprises Incorporated	33
Catalent	30
Boyd Brothers Transportation	28
The Home Depot Incorporated	28
McDonald's	27
Sage Products Incorporated	27
Lifetime Fitness	25
McHenry County College	25
Spirit Halloween	25
Best Buy	24
Centegra Health Systems	24
Working World Incorporated	24
Consolidated School District 158	22
True Value	21
Berkshire Hathaway	19
C.R. England, Inc	19
Danaher Corporation	19
Kohl's	19
Advance Auto Parts Incorporated	18
Advantage Solutions	18
Coilcraft	18
Medela Incorporated	18
Swift Refrigerated	18
AlliedBarton Security Services	17
Crst Lease Purchase	17
La Petite Academy	17
Medtronic	17
Meijer	17
Ameriplan	16
Corporate Services Incorporated	16
Boston Market	15
Mercy Health System	15
Securitas Security Services USA Incorporated	15
Athletico	14
Lowe's Companies, Inc	14

Maurices	14
Office Depot	14
Wti Transport	14
Aramark	13
Crystal Lake Community Consolidated School District 47	13
JCPenney	13
Ntb Trucking	13
Promoworks	13
Sears	13
Spencer Gifts	13
Unicarriers	13
United States Security Associates	13
BMO Financial Group	12
Blain Supply	12
Burlington Coat Factory	12
Dick's Sporting Goods Incorporated	12
Dollar General	12
Internet Truckstop	12
Jc Trucking Positions	12
PetSmart	12
Werner Enterprises	12
Catalent Pharma Solutions	11
Healthpro Rehabilitation	11
L Brands	11
Wendy's Restaurants	11
Jbs Carriers	10
Petco	10
Ampac Holdings, Llc	9
Crossmark	9
Dart Transit Company	9
Gander Mountain	9
Great States Trucking	9
Huntley Consolidated Schl Dist	9
KFC	9
Koch Trucking Marine	9
Mchenry School District 15	9
Nussbaum	9
SI Wellspring Llc	9
Valspar	9

Western Express	9
Barr-Nunn	8
Blain's Farm And Fleet	8
Bridgestone / Firestone	8
Cameron Craig Group	8
Catalent Pharma Solutions Llc	8
JP Morgan Chase Company	8
Mueller Services Incorporated	8
Quality Placement Authority	8
Young Innovations Incorporated	8
Banfield Pet Hospital	7
Bank of America	7
Buffalo Wild Wings	7
Community Unit School District 300 Classified And Administration	7
Ew Wylie Corporation	7
General Rv	7
Groendyke Transport	7
Intermatic Incorporated	7
K & B Transportation	7
Knight Transportation	7
Landstar Crosson	7
Loudon County Trucking	7
Ozark	7
P & S Transportation	7
Ryder System Incorporated	7
Select Advantage Incorporated	7
Snap On Incorporated	7
Starbucks Coffee Company	7
Transcarrier Inc	7
Transco Lines Incorporated	7
Advantage Sales & Marketing	6
Aptar Group Incorporated	6
Bath & Body Works Direct, Inc	6
Black Diamond Plumbing & Mechanical	6
Burger King	6
Chico's	6
Comfort Keepers	6
Diversified Transfer & Storage	6
Firstservice Residential	6

Huntsman International Llc	6
Kl Haring Transportation	6
Mattress Firm	6
Murphy Oil Corporation	6
Portillos	6
Psa Healthcare	6
Roehl Transport	6
Tutera Group	6
Advocate Health Care	5
Alden Hebron District 19	5
Anderson Trucking Services	5
Aptargroup, Inc	5
Barnes & Noble	5
Best Version Media	5
Burlington Stores	5
Chipotle Mexican Grill	5
Community Unit District 300	5
Correct Care Solutions	5
Correction Care Solutions, Llc	5
Crete Carrier Corporation	5
Crystal Pines Rehabilitation & Health Care Center	5
Design Transportation	5
Durex Industries	5
Einstein Bros Bagels	5
Emcor Group	5
First Midwest Bank	5
First Transit	5
Fresh Thyme Farmers Market	5
Gap Inc.	5
H.J. Heinz Company	5
Harvard Community Unit School District 50	5
Jobgiraffe	5
Marketsource Incorporated	5
Mchenry High School District 156	5
Medtravelers	5
Panera Bread	5
Rent-A-Center	5
Rush Enterprises Incorporated	5
Senior Lifestyle Corporation	5

Shaw Media	5
The Alden Network	5
West Side Transport	5
AT&T	4
Actionlink	4
Barnes & Noble Incorporated	4
Belmont Village Senior Living	4
Berry Plastics	4
Citi	4
Community High School District 155	4
Crst Expedited	4
Dell	4
Dollartree	4
Domino's Pizza	4
Dunkin' Donuts	4
Faht	4
Fox Lake Grade School District	4
Freedom For Everyone	4
Fur The Love Of Dogs	4
Heartland Dental	4
Jo-Ann Fabric	4
Jp Morgan Chase	4
Procare Therapy	4
Riley Community Consolidated School District 18	4
Rush Enterprises	4
Sage Products	4
Sherwin Williams	4
Smith Transport	4
State Farm Insurance Companies	4
Sunrise Senior Living, Inc.	4
Swift Transportation	4
Terex Corporation	4
The Fresh Market, Inc	4
Tri National Corporation	4
United States Postal Service	4
Wisconsin Illinois Senior Housing, Inc	4
Woodstock Community Unit School District 200	4
YMCA	4
Accuquest	3

<b>Aegis Therapies</b>	<b>3</b>
<b>Alexander Leigh Center For Autism</b>	<b>3</b>
<b>Aurora University</b>	<b>3</b>
<b>Autumn Leaves</b>	<b>3</b>
<b>Back In Motion Physical Therapy</b>	<b>3</b>
<b>Bass Marketing</b>	<b>3</b>

## Appendix B: Peer Student Associations

Org Type	McHenry County College	College of Lake County	Elgin Community College	Harper College	Oakton College	Kishwaukee College	Prairie State College	Rock Valley College
<b>Multicultural</b>	Asian American Club	African Heritage Club	Advocacy for Abled & Disabled Students (ADAPT)	ADS Success Club (Access and Disabilities)	African Student Club	Black Student Union	All Latin Alliance (ALA)	Association of Latin American Students (ALAS)
	Black Student Union	Asian Student Alliance	Black Student Association (BSA)	American Sign Language (ASL Club)	Black Student Union	Black Male Initiative	Black Student Union (BSU)	Black Student Union (BSU)
	Latinos Unidos	Black Student Union	Chinese Student Club	Black Student Union (BSU)	French Club	Latinos Unidos	Student Veterans Club	Multicultural Club
	Multicultural Club	First Generation Club	Muslim Student Association	Chinese Club	Hawaiian Music Club	Association of Culture & Language		Japanese Multimedia and Culture Club (JMC)
	Pride Club	International Club	Organization of Latin American Students (OLAS)	Deaf Club	Hillel	Spectrum		Rock Valley College Gay-Straight Alliance (GSA)
	Spanish Club	Lakeshore Student Campus Association	Peace and Justice	German Club	Hispanic Club			RVC Veterans Association
	Student Peace Action Network (SPAN)	Latino Alliance	Society for Extraordinary Men	Indian/Pakistani Student Association (IPSA)	Japan Club			
	Student Veterans of America	Men of Vision	United States of All Cultures (USAC)	International Students Club	Korean Student Association			



		Muslim Student Association		Latinos Unidos	Muslim Student Association			
		PRIDE Alliance		Pride Club	Pride Club			
		Real Men Talk		Raices	Philippino American Youth Organization (PAYO)			
		Reclaiming Eve		Society for Modern Masculinities	Polish Club			
		Sister 2 Sister			Students for Social Justice			
		Social Action Club						
		Student Veterans of CLC						
<b>Religious</b>	Oasis	Campus Crusade for Christ (CRU)	Spartan Christian Fellowship	Alpha Omega Club (Fulfilled Club)	Mission Bible	Nurses Christian Fellowship		InterVarsity Christian Fellowship
		Catholic Club		Buddhist Interest Group	Oakton Christian Fellowship	S.O.U.L (Students Out Uniting with the Lord)		Latter Day Saints Student Association (LDSSA)
		Hillel		CRU				
		InterVarsity Christian Fellowship						
<b>Education &amp; Service</b>	Business Club	Architecture Club	Associated Nursing Students (ANS)	Accounting Club	Early Childhood Education Club (ECE)	Alpha Delta Nu	Alpha Beta Gamma	Alpha Delta Nu

	Criminal Justice Club	Associate Degree Student Nurses	College Programming Board (CPB)	Astronomy Club	Ecology Club	Student Nursing Organization (SNO)	Campus Programming Board (CPB)	Chemistry Club
	Forensics Team	Business Club	Future Teachers Club	Biology Club	Honors Student Organization (HSO)	Aviation Club	Dental Hygiene (Freshman)	Mathematics, Engineering, Physics, and Astronomy Club (MEPA)
	Game Club	Chemistry Club	Health Careers Students	Business & Entrepreneurship Club	Oakton Helping Others	Business Club	Dental Hygiene (Senior)	Psychology/Sociology Research Club
	Generation End It	Computer Club	Phi Theta Kappa (PTK)	Ethics Bowl	Phi Theta Kappa Honors Society (PTK)	Criminal Justice Club	Nursing Club	Rock Valley Aviation Club
	Health Professions Club	Engineering Club	Students Educationally Receiving Volunteer Experience (SERVE)	GED: Life Won't Wait	Physical Therapist Assistant (PTA)	Engineering Club	Pre-Pharmacy/Pre-Medicine Club	Rock Valley College Pre-Pharmacy Club
	Phi Theta Kappa Honor Society	Literary Arts Society	Student Government	Geology/Paleontology Club	Reaching Out to Others	Future Educators Association	Phi Theta Kappa	Running Start Club
	Psi Beta / Psych Club	Math Club		Health Career & Pre-Med Club	Student Nurses Club	H.O.P.E	Pioneer Peer Educators	RVC Music Educators Club
	Social Sciences Club	Phi Theta Kappa Honors		Honors Society	UNISEF	Kishwaukee Sociology Club	Political Science Club	Student Dental Hygienists' Club (SADHA)
	Student Nursing	Psychology Club		Hospitality Service Club		National Society of	Protégé Club	That Club Which None Greeter Can

	Organization (NSO)					Leadership & Success		Be Conceived (Philosophy Club)
	Student Government	Student American Dental Hygienists Association (SADHA)		Human Services Club		Skills USA	PSI Beta Honors Society	TriO Complete
	Student Occupational Therapy Assistants (SOTA)	Student Government Association		Kappa Beta Delta		Student Government Association	STEM Club	Student Life Default
	Student Trustee	Student United Way/Volunteer Club		Kinesiology Club		Phi Theta Kappa	Student Government Association	Think. Create. Lead
	College Conservatives			Lambda Epsilon Chi (LEX)		Forensics Team	Student Review	Campus Activities Board (CAB)
	College Democrats			Law Association at Harper				Student Government Association (SGA)
				Math Club				Phi Theta Kappa Honors Society
				Model United Nations				Speeching to the Choir (Speech Club)
				Mu Alpha Theta				Dialogue
				National Kitchen & Bath Association (NKBA)				Law and Politics Association (LAPA)
				Operation Snowball				Enactus Rockford (Enactus)
				Phi Theta Kappa				Circle K International (Circle K)

				Rad Tech Club				RVC Students of Service (RVS SOS)
				Society of Engineers				Volunteer Incentive Program (VIP)
				Speech & Debate Team				
				Student Activities Board				
				Student Education Association				
				Student American Dental Hygienists' Association (SADHA)				
				Student Government Association				
				Student Nurses Association				
				Student Veterans Association				
				Think Tank				
				Women in Science & Engineering (WISE)				
<b>Creative Arts</b>	Art Club	Center Stage Theatre Club	ECC Observer Student Newspaper	Clay Guild	Art Club	Computer Art Club	Etel Billing Theatre Society (Drama Club)	Rock Valley College Chamber Singers
	Clay Club	Chronicle	Hospitality Club	Graphic Design Club	Ceramics Club	Floral Club (SAIFD)	One Voice Gospel Choir	Rock Valley College Woman's Choir
	Drama Club	CLC Ceramic Arts Club		The Harbinger	Graphic Design Club	Horticulture Club		One Club to Rule Them All (One Club)
	McHenry Student Radio (MSR)	Dance Club		Harper Dance Company	Musicians Club	Mudslingers		

	Music Club			Harper's Bizarre Fashion Club		Koustics		
	Photography Club			Literature & Creative Writing Club				
	The Tartan			Manufacturing & Welding Club				
	Writer's Block - Creative Writing			Point of View				
				Theatre Club				
				WHCM 88.3 FM				
<b>Environment</b>	Down to Earth	Environmental Club		Environmental Club		Tree Huggers	Sustainability Club	A Plant Society Club
								RVC Sustainable Energy
								Students Responsible for Environmental Sustainability (SRES)
<b>Athletics and Health</b>	Meditation Club	Cheer Club		Judo Club	Cheer & Dance Team	Intercollegiate Athletics (NJCAA)	Ballet Club	Students for Better Breathing
		Wellness Club		Pom/Dance			Photo Society	RVC Dance Team
				Spike Ball			Video Game Design Club	
				Spirit Crew				
				Water Polo Club				
<b>Entertainment &amp; Other Interests</b>		Fandom Club	Anime Club	Animal Rights	Habitat for Humanity	Anime Club	Anime Club	Belegarth Medieval Combat Society
			Gamers United	Chess Club				Table Top Gaming Club

				Film Club				Team Deathmatch
				Saving Animals via Education				
				Sci-Fi, Fantasy, and Gaming Club				
				Video Game Club				

**Appendix C: Selected Postsecondary Accountability Initiatives**

Program/Sponsoring Organization	Type	Purpose	Measures	Data Sources
Academic Quality Improvement Program (AQIP) ( <a href="http://www.hlcommission.org/aqip-home">www.hlcommission.org/aqip-home</a> )/Sponsored by the Higher Learning Commission	Accreditation	To infuse the principles and benefits of continuous improvement into the culture of colleges and universities.	Helping students learn, accomplishing other distinctive objectives, understanding students' and other stakeholders' needs, valuing people, leading and communicating, supporting institutional operations, measuring effectiveness, planning continuous improvement, building collaborative relationships.	Institutions
APLU Metrics Working Group/ Association of Public and Land Grant Universities - Committee on Innovation, Economic Prosperity, and Competitiveness	University engagement	To develop a comprehensive set of tools to help institutions identify and evaluate their economic engagement strategies.	Institutional, student, and community impact measures.	Institutions
College Results Online ( <a href="http://www.edtrust.org/issues/higher-education/college-results-online">http://www.edtrust.org/issues/higher-education/college-results-online</a> )/the Ed Trust	Consumer information	Provides facts on college graduation rates to students, parents, school counselors, policymakers, and researchers.	13 factors from IPEDS Graduation Rate Survey, based on first-time full-time freshmen seeking bachelor's degrees or equivalent known to affect graduation rates: student scores on college-admissions tests, institution size, and percentage of low-income students on campus. Detailed methodology at <a href="http://www.collegeresults.org/aboutthedata.aspx">http://www.collegeresults.org/aboutthedata.aspx</a> .	IPEDS
College Navigator ( <a href="http://nces.ed.gov/collegenavigator">http://nces.ed.gov/collegenavigator</a> )/ U.S. Department of Education, Institute of Education Sciences	Consumer information	Help students, parents, high school counselors, and others get information about over 7,000 U.S. colleges and universities.	IPEDS data on participating public, private non-profit and for-profit institutions including special learning opportunities, student services, religious affiliation, federal aid, faculty by function, tuition/fees/estimated expenses, financial aid, net price, enrollment, admissions, retention and graduation rates, programs/majors, varsity athletic teams, accreditation, security, cohort default rates.	NCES IPEDS; data are updated on a regular basis from the Office of Post-Secondary Education (OPE) and Federal Student Aid office (FSA)
Community College Survey of Student Engagement ( <a href="http://www.csse.org/aboutcsse">http://www.csse.org/aboutcsse</a> )/University of Texas at Austin	Student engagement	Help community colleges assess their educational practices so they can improve student outcomes.	Active and collaborative learning, student effort, academic challenge, student-faculty interaction, and support for learners.	Survey administered to community college students to assess institutional practices and

Program/Sponsoring Organization	Type	Purpose	Measures	Data Sources
				student behaviors correlated with student learning and retention
Complete College America ( <a href="http://www.completecollege.org/">www.completecollege.org</a> )/Complete College America	Goal-oriented	Increase the number of Americans with a college degree or credential of value and close attainment gaps for traditionally underrepresented populations.	Degree production (Associate, Bachelor's, certificates), graduation rates (full-time, part-time, transfer by degree/certificate), transfer out (for two-year colleges only), time to degree.	Public institutions and IPEDS
Electronic Campus ( <a href="http://www.electroniccampus.org/">http://www.electroniccampus.org/</a> )/Southern Regional Education Board	Consumer Information	To give students and parents concise, consumer-friendly information on nonprofit, private colleges, and universities in 16 southern states.	General information about adult and e-learning, online courses and programs for adult and e-learners, specialized academic services for adult and e-learners, other assistance for adult and e-learners	Institutions in SREB
Gainful Employment ( <a href="http://ifap.ed.gov/GainfulEmploymentInfo/index.html">http://ifap.ed.gov/GainfulEmploymentInfo/index.html</a> )/U.S. Department of Education	Regulatory	Institutions participating in financial assistance programs authorized under Title IV of the Higher Education Act must report specific student information. Educational programs covered under these regulations must lead to an associate, Bachelor's, graduate, or professional degree in preparing a student for gainful employment in recognized occupations.	The name and Standard Occupational Classification (SOC) code of the occupations that the program prepares students to enter, on-time graduation rate for students completing the program, the tuition and fees the institution charges a student for completing the program, typical costs for books and supplies, the job placement rate for students completing the program, the median loan debt incurred by students who completed the program.	Not really a data source, just an article.
Higher Education Opportunity Act Information on College Costs ( <a href="http://collegecost.ed.gov/">http://collegecost.ed.gov/</a> )/U.S. Department of Education	Consumer Information	Increase transparency around college costs.	Tuition and net prices at postsecondary institutions, state spending for postsecondary education, proprietary postsecondary institutions receiving more than 90% of revenues from Title IV student aid.	U.S. Department of Education, National Center for Education Statistics, Integrated Post-Secondary Education Data System (IPEDS),



Program/Sponsoring Organization	Type	Purpose	Measures	Data Sources
Integrated Postsecondary Education Data System (IPEDS) ( <a href="http://nces.ed.gov/ipeds">http://nces.ed.gov/ipeds</a> ) /National Center for Education Statistics	Description and trend analysis	A system of annual surveys gathering information from every institution participating in the federal student financial aid programs. These data are made available to students and parents through the College Navigator Web site and to researchers and others through the IPEDS Data Center.	Institutional characteristics, institutional prices, enrollment, student financial aid, degrees and certificates conferred, student persistence and success, and institutional human and fiscal resources.	Institutions
Longitudinal Student Data System ( <a href="http://nces.ed.gov/programs/slds">http://nces.ed.gov/programs/slds</a> ) / U.S. Department of Education	System-building	To strengthen the states' ability to manage, analyze, and use education data to improve student learning and facilitate research to increase student achievement and close achievement gaps.	Student-level enrollment, demographic and program participation; exit, drop out, transfer, and completion information of P-16 programs; assessment of data quality, reliability, and validity.	Institutions
National Community College Benchmark Project <a href="http://www.nccbp.org/">http://www.nccbp.org/</a> Johnson County Community College	Peer comparison	To standardize a nationwide benchmark reporting process	Twenty-five measures of students and student outcomes, institutional effectiveness, and community and workforce development.	Institutions
National Survey of Student Engagement ( <a href="http://nsse.iub.edu/">http://nsse.iub.edu/</a> ) /Indiana University Center for Postsecondary Research	Student engagement	To collect information at hundreds of four-year colleges and universities about student participation in programs and activities that institutions provide for their learning and personal development. The results provide an estimate of how undergraduates spend their time and what they gain from attending college.	Level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experience, supportive campus environment.	Students – More than 537,000 students from 751 institutions in the U.S. and Canada completed the survey.

Program/Sponsoring Organization	Type	Purpose	Measures	Data Sources
Quality Matters ( <a href="http://www.qmprogram.org/">http://www.qmprogram.org/</a> ) /Quality Matters	Quality assurance	To certify the quality of online and blended courses.	Learning Objectives (Competencies), Assessment and Measurement, Instructional Materials, Learner Interaction and Engagement, Course Technology, Learner Support, Accessibility	Faculty/ instructors
New Leadership Alliance for Student Learning and Accountability ( <a href="http://www.newleadershipalliance.org/">http://www.newleadershipalliance.org/</a> ) /New Leadership Alliance for Student Learning and Accountability	Accountability	In partnership with the Center of Inquiry and the Wabash National Study, the Alliance is helping to create an expanded (second generation) template that will add to other existing models, such as the Voluntary System of Accountability (VSA) and the University and College Accountability Network (U-CAN).	TBD	Institutions
Science and Technology in America's Reinvestment Measuring the Effect of Research on Innovation, Competitiveness, and Science (STAR METRICS) <a href="http://nrc59.nas.edu/star_info2.cfm">http://nrc59.nas.edu/star_info2.cfm</a> /Federal Demonstration Partnership	Accountability	To measure the science impacts on economic outcomes, such as job creation; on scientific outcomes, such as citations and patents; and on social outcomes, such as public health.	Level 1 focuses on job impacts. Level 2 measures to address the impact of federal science investment on scientific knowledge (using metrics such as publications and citations), social outcomes (e.g. health outcomes measures and environmental impact factors), workforce outcomes (e.g. student mobility and employment), and economic growth (e.g. tracing patents, new company start-ups and other measures).	Institutions
Transparency by Design ( <a href="http://www.wcet.wiche.edu/">www.wcet.wiche.edu/</a> ) Western Interstate Commission for Higher Education Cooperative for Educational Technologies	Consumer information	To provide adult learners with the data needed to select a college offering degrees in a distance education setting.	Regional accreditation, degrees/certificates offered, enrollment, featured programs, student demographics, learner progress (retention and completion), undergraduate student engagement and satisfaction, alumni outcomes by degree level. Program information including credits-to-degree, specializations and program-level learning outcomes, assessment measures and	Institutions

Program/Sponsoring Organization	Type	Purpose	Measures	Data Sources
			recent results of those assessments for each of the featured programs.	
University and College Accountability Network ( <a href="http://www.ucan-network.org/">http://www.ucan-network.org/</a> ) / National Association of Independent Colleges and Universities	Consumer Information	To give students and parents concise, consumer-friendly information on nonprofit, private colleges, and universities in a common format	Admissions, enrollment, academics, student demographics, graduation rates, most common fields of study, transfer of credit policy, accreditation, faculty information, class size, tuition and fee trends, price of attendance, financial aid, campus housing, student life, campus safety, and institution-specific information on average loans at graduation, undergraduate class-size breakdown, and net tuition.	Institutions
U.S. Education Dashboard ( <a href="http://dashboard.ed.gov/about.aspx">http://dashboard.ed.gov/about.aspx</a> ) / U.S. Department of Education	Performance	To show indicators of how the nation and each state are progressing toward the national goal of once again having the highest proportion of college graduates in the world.	College attainment, early learning through high school, postsecondary education and training, teachers and leaders, excellent education for all.	Institute of Education Sciences (IES), ED Facts, IPEDS Data Center, the Grant Award Database, the Federal Student Aid Data Center, and ED Data Express
Voluntary Framework of Accountability ( <a href="http://www.aacc.nche.edu/Resources/aaccprograms/vfa/Pages/default.aspx">http://www.aacc.nche.edu/Resources/aaccprograms/vfa/Pages/default.aspx</a> ) / American Association of Community Colleges	Accountability	To gauge how well community colleges, perform in serving a variety of students and purposes. "first national system of accountability specifically FOR community colleges and BY community colleges"	College readiness, student progress/outcomes/success, career and technical education, non-credit courses, adult basic education/GED measures.	Community colleges
Voluntary System of Accountability ( <a href="http://www.voluntarysystem.org/index.cfm">http://www.voluntarysystem.org/index.cfm</a> ) / Association of Public and Land Grant Universities and the Association of State Colleges and Universities	Consumer information	To supply basic, comparable information on the undergraduate student experience to students and their families, campus administrators, campus leaders, faculty, the public at large, and legislators and public policy makers, through the <b>College</b>	Student characteristics, undergraduate success and progress rates, costs of attendance and financial aid, campus life, undergraduate admissions, degrees/areas of study/future plans	Input from student/family focus groups, feedback from the higher education community, and research on higher education.  Most of the data are from available data sources with established

Program/Sponsoring Organization	Type	Purpose	Measures	Data Sources
		<p><b>Portrait.</b> The College Portrait seeks to produce comparisons, not rankings, to assist prospective college students to choose a “right fit” university</p>		<p>definitions and reporting conventions, For each</p>
<p>Workforce Data Quality Initiative (<a href="http://www.dqcampaign.org/files/Summary_of_Workforce_Data_Quality_Initiative.pdf">http://www.dqcampaign.org/files/Summary_of_Workforce_Data_Quality_Initiative.pdf</a>) /U.S. Department of Labor</p>	<p>System-building</p>	<p>To help states:</p> <ol style="list-style-type: none"> <li>1. Develop or improve state workforce longitudinal data systems.</li> <li>2. Enable workforce data to be matched with education data to create longitudinal data systems with individual-level information from Pre-K through postsecondary and the workforce.</li> <li>3. Improve the quality and breadth of data in workforce longitudinal data systems.</li> <li>4. Use longitudinal data to provide information about program operations and to analyze the performance of education and training programs.</li> <li>5. Provide information to consumers to help them select education and training programs.</li> </ol>	<p>Data for the following programs: Workforce Investment Act Title I, Wagner-Peyser Act, Trade Adjustment Assistance program data, Unemployment Insurance wage record and benefit data, linkages to existing state education agency longitudinal data.</p>	<p>State Workforce Agencies</p>

**Appendix D: WIOA Approved Programs Within a 20 Mile Radius**

CIP	School	City	Program
30506	Northern Illinois University	Hoffman Estates	Geographical Information Systems (GIS) Certification
110101	Columbia College	Gurnee	Bachelor of Science in Management Information Systems
110101	Computer Training Source, Inc.	Schaumburg	IT Management/PMP
110101	Computer Training Source, Inc.	Schaumburg	PMP, Six Sigma, MS Project, MySQL Program
110101	Computer Training Source, Inc.	Schaumburg	Project Management Professional (PMP)
110103	SOLEX College	Wheeling	Information Technology Project Managers
110203	COMNet Group Inc.	Lake Forest	Android Software Development
110203	COMNet Group Inc.	Crystal Lake	Android Software Development
110203	COMNet Group Inc.	Hoffman Estates	Android Software Development
110299	Management & Information Tech Solutions (MITS)	Schaumburg	E-commerce (for Programmers) Webmaster: Internet App. Devlp
110299	Management & Information Tech Solutions (MITS)	Schaumburg	Comprehensive Masters Certificate Program
110299	Management and Information Tech Solutions (MITS)	Gurnee	E-commerce (for Programmers) Webmaster: Internet App. Devlp
110299	Management and Information Tech Solutions (MITS)	Gurnee	Comprehensive Masters Certificate Program
110501	Management & Information Tech Solutions (MITS)	Schaumburg	Big Data Analytics, Oracle and Hadoop Combo
110501	Management & Information Tech Solutions (MITS)	Schaumburg	PMP, Quality Management and ERP Combo
110501	Computer Training Source, Inc.	Schaumburg	Business Analysis/PMP
110501	Computer Training Source, Inc.	Schaumburg	PMP/Agile/Six Sigma/ITIL
110501	Computer Training Source, Inc.	Schaumburg	Agile/BA/CAP/PMP Program
110501	Management and Information Tech Solutions (MITS)	Gurnee	PMP, Quality Management and ERP Combo
110801	Management & Information Tech Solutions (MITS)	Schaumburg	Computer System Analysis Pro
110801	Management & Information Tech Solutions (MITS)	Schaumburg	Web Design and Development

110801	Management & Information Tech Solutions (MITS)	Schaumburg	Careerpro E-commerce Comp.
110801	Management and Information Tech Solutions (MITS)	Gurnee	Web Design and Development
110801	Management and Information Tech Solutions (MITS)	Gurnee	Computer System Analysis Pro
110801	Management and Information Tech Solutions (MITS)	Gurnee	Careerpro E-commerce Comp.
110802	Management & Information Tech Solutions (MITS)	Schaumburg	Oracle DBA and Oracle 11i Apps DBA combo
110802	Management & Information Tech Solutions (MITS)	Schaumburg	Oracle Apps 11i DBA / Technical Foundations of Oracle Apps
110802	Management and Information Tech Solutions (MITS)	Gurnee	Oracle Apps 11i DBA / Technical Foundations of Oracle Apps
110802	Management and Information Tech Solutions (MITS)	Gurnee	Oracle DBA and Oracle 11i Apps DBA combo
110899	Management & Information Tech Solutions (MITS)	Schaumburg	Quality Assurance and Software Testing Comprehensive
110899	Management and Information Tech Solutions (MITS)	Gurnee	Quality Assurance and Software Testing Comprehensive
111001	Management & Information Tech Solutions (MITS)	Schaumburg	Network and Systems Administration
111001	Computer Training Source, Inc.	Schaumburg	Adobe Certified Expert (ACE) Program-CTS
111001	Computer Training Source, Inc.	Schaumburg	Certified Technical Trainer (CTT+)
111001	Computer Training Source, Inc.	Schaumburg	Internet Marketing Program
111001	Computer Training Source, Inc.	Schaumburg	IT Support Specialist Program
111003	Computer Training Source, Inc.	Schaumburg	Agile/CISSP/ITIL/PMP
111003	Northern Illinois University	Hoffman Estates	Graduate Certificate in Cybersecurity
111004	Computer Training Source, Inc.	Schaumburg	Frontend Web Developer Program
111004	Computer Training Source, Inc.	Schaumburg	Web Professional Training Program
111004	Computer Training Source, Inc.	Schaumburg	Web Design Specialist Program
111006	Computer Training Source, Inc.	Schaumburg	A+ Helpdesk Technician Program

111006	Computer Training Source, Inc.	Schaumburg	PMP, Six Sigma Green Belt (CSSGB)
111099	Management & Information Tech Solutions (MITS)	Schaumburg	PMP MS Project ITIL Foundation/Practitioner Combo
111099	Management and Information Tech Solutions (MITS)	Gurnee	PMP MS Project ITIL Foundation/Practitioner Combo
130403	Northern Illinois University	Hoffman Estates	Master of Science in Education - Adult & Higher Education
131001	Northern Illinois University	Hoffman Estates	Special Education - Masters of Science in Education
131315	Northern Illinois University	Hoffman Estates	M.S. Ed. Program in Instructional Technology
139999	Wolf Driving School	Schaumburg	4 Weeks CDL Program
139999	Wolf Driving School	Schaumburg	6 Week CDL Program
139999	Wolf Driving School	Schaumburg	5 Week CDL Program
150702	Management & Information Tech Solutions (MITS)	Schaumburg	Six Sigma Green Belt (SSGB)
150702	Management and Information Tech Solutions (MITS)	Gurnee	Six Sigma Green Belt (SSGB)
151204	Management & Information Tech Solutions (MITS)	Schaumburg	Oracle Internet Dev. and Oracle Financials Combo-MITS
151501	Northern Illinois University	Hoffman Estates	Industrial Project Management
190604	Northern Illinois University	Hoffman Estates	IFMA's Facility Management Professional (FMP) Credential
190604	Northern Illinois University	Hoffman Estates	IFMA's Sustainability Facility Professional Credential
430103	Columbia College	Gurnee	Bachelor of Arts in Criminal Justice Administration
430103	Columbia College	Crystal Lake	Bachelor of Arts in Criminal Justice Administration
440000	Columbia College	Gurnee	Bachelor of Arts in Human Services
440000	Columbia College	Crystal Lake	Bachelor of Arts in Human Services
460403	Legacy Inspection Training	Mundelein	116 Professional Level Home Inspection Course
470303	SOLEX College	Wheeling	Industrial Maintenance Technician Certificate Program
470303	Chicago Professional Center, Inc.	Wheeling	Industrial Maintenance
470303	Chicago Professional Center, Inc.	Wheeling	Maintenance
480508	First Institute Training & Management	Libertyville	Welding Technology Program
490205	Eagle Training Services	Crystal Lake	Accelerated CDL-A Course
490205	Eagle Training Services	Crystal Lake	CDL-A Semi-Tractor Trailer Driver Training Basic 160
490205	Eagle Training Services	Crystal Lake	HazMat Endorsement Study Course

490205	Eagle Training Services	Crystal Lake	CDL-A Semi-Tractor Trailer Driver Training Enhanced 240
490205	Kotra CDL Driving School	Park City	Advanced 240 hour CDL Truck Driving Program
500404	Northern Illinois University	Hoffman Estates	Industrial Workplace Design Systems
510705	SOLEX College	Wheeling	Medical Office Computerization, Automation and Management
510710	First Institute Training & Management	Libertyville	Medical Office Assistant
510713	JCM III Corporation	Schaumburg	Medical Coding & Billing
510713	Management & Information Tech Solutions (MITS)	Schaumburg	MEDICAL INFORMATION SYSTEMS & MANAGEMENT
510713	Management & Information Tech Solutions (MITS)	Schaumburg	Medical Office Coding and Billing Specialist
510713	Management and Information Tech Solutions (MITS)	Gurnee	MEDICAL INFORMATION SYSTEMS & MANAGEMENT
510713	Management and Information Tech Solutions (MITS)	Gurnee	Medical Office Coding and Billing Specialist
510801	Management & Information Tech Solutions (MITS)	Schaumburg	Certified Administrative Medical Assistant
510801	Management & Information Tech Solutions (MITS)	Schaumburg	Certified Clinical Medical Assistant
510801	Management & Information Tech Solutions (MITS)	Schaumburg	ESL, Medical Office Asst, Billing and Coding Combo
510801	Management & Information Tech Solutions (MITS)	Schaumburg	Medical Assistant Comprehensive
510801	SOLEX College	Wheeling	Medical Assistant Career Program
510801	Management and Information Tech Solutions (MITS)	Gurnee	Certified Administrative Medical Assistant
510801	Management and Information Tech Solutions (MITS)	Gurnee	Certified Clinical Medical Assistant
510801	Management and Information Tech Solutions (MITS)	Gurnee	ESL, Medical Office Asst, Billing and Coding Combo
510801	Management and Information Tech Solutions (MITS)	Gurnee	Medical Assistant Comprehensive
510801	International Training Academy	Schaumburg	Medical Assistant
510802	Mildun Training Center of Illinois	Wheeling	Medical Assistant



510805	Management & Information Tech Solutions (MITS)	Schaumburg	Pharmacy Tech and Customer Service Combo
510805	Management and Information Tech Solutions (MITS)	Gurnee	Pharmacy Tech and Customer Service Combo
510806	JCM III Corporation	Schaumburg	Physical Rehabilitation Aide(51-2604)
510806	SOLEX College	Wheeling	Physical Therapist Assistant AAS Degree
510902	A Plus Healthcare Training	Saint Charles	Electrocardiography Technician Training Program
511099	SOLEX College	Wheeling	Phlebotomy Technician
513801	Ambria College of Nursing	Hoffman Estates	Associates Degree in Nursing (LPN to RN Completion Program)
513901	Ambria College of Nursing	Hoffman Estates	Practical Nursing Program or LPN Program
513902	JCM III Corporation	Schaumburg	Basic Nurse Assistant
513902	JCM III Corporation	Schaumburg	Patient Care Technician (PCT)
513902	Management & Information Tech Solutions (MITS)	Schaumburg	ESL, Computer Office and Patient Care Technician
513902	A Plus Healthcare Training	Saint Charles	Patient Care Technician
513902	Management and Information Tech Solutions (MITS)	Gurnee	ESL, Computer Office and Patient Care Technician
519999	JCM III Corporation	Schaumburg	Phlebotomy Technician (511009)
519999	JCM III Corporation	Schaumburg	EKG Basic and Advance
520201	Columbia College	Gurnee	Bachelor of Science in Business Administration
520201	Columbia College	Gurnee	Bachelor of Arts in Business Administration
520201	Columbia College	Crystal Lake	Bachelor of Arts in Business Administration
520201	Columbia College	Crystal Lake	Bachelor of Science in Business Administration
520201	Northern Illinois University	Hoffman Estates	Bachelor of Science in Business Administration (BSBA)
520201	Northern Illinois University	Hoffman Estates	M.B.A. Program
520205	Northern Illinois University	Hoffman Estates	Master of Science in Industrial Management
520211	Northern Illinois University	Hoffman Estates	Project Management Professional(PMP) Certification Prep
520401	Management & Information Tech Solutions (MITS)	Schaumburg	PMP and MS Project Combo
520401	Computer Training Source, Inc.	Schaumburg	Administrative Assistant Program-CTS
520401	Computer Training Source, Inc.	Schaumburg	Administrative Professional Program-CTS
520401	Computer Training Source, Inc.	Schaumburg	Adobe Creative Cloud & Microsoft Office Program
520401	Computer Training Source, Inc.	Schaumburg	Basic Computer Literacy Program

520401	Computer Training Source, Inc.	Schaumburg	Executive Assistant Training Program
520401	Computer Training Source, Inc.	Schaumburg	Microsoft Office Specialist (MOS) Program
520401	Computer Training Source, Inc.	Schaumburg	MS Office/Web Maintenance/QuickBooks Program
520401	Computer Training Source, Inc.	Schaumburg	QuickBooks ProAdvisor Training Program
520401	Computer Training Source, Inc.	Schaumburg	Office Manager Training Program
520401	Computer Training Source, Inc.	Schaumburg	QuickBooks Specialist Training Program
520402	Computer Training Source, Inc.	Schaumburg	Microsoft Office Specialist/Computer Repair (A+)
520408	Computer Training Source, Inc.	Schaumburg	Bookkeeping Specialist
521001	Northern Illinois University	Hoffman Estates	SHRM Learning System for SHRM-CP/SHRM-SCP Certification Prep
521201	Northern Illinois University	Hoffman Estates	Cert. of Grad. Study in Management Information Systems
521206	Management & Information Tech Solutions (MITS)	Schaumburg	CAPM and MS Project Combo
521206	Management & Information Tech Solutions (MITS)	Schaumburg	CAPM and SCM Combo
521206	Management & Information Tech Solutions (MITS)	Schaumburg	Comprehensive Office Support and Management
521206	Management & Information Tech Solutions (MITS)	Schaumburg	Management Associate Program
521206	Management & Information Tech Solutions (MITS)	Schaumburg	Project Management
521206	Management & Information Tech Solutions (MITS)	Schaumburg	Project Management and Computer Info Systems Management
521206	Management and Information Tech Solutions (MITS)	Gurnee	CAPM and MS Project Combo
521206	Management and Information Tech Solutions (MITS)	Gurnee	CAPM and SCM Combo
521206	Management and Information Tech Solutions (MITS)	Gurnee	Project Management
521206	Management and Information Tech Solutions (MITS)	Gurnee	Management Associate Program

<b>521206</b>	Management and Information Tech Solutions (MITS)	Gurnee	Comprehensive Office Support and Management
<b>521206</b>	Management and Information Tech Solutions (MITS)	Gurnee	Project Management and Computer Info Systems Management
<b>521601</b>	Northern Illinois University	Hoffman Estates	Master of Science in Taxation
<b>529999</b>	Management & Information Tech Solutions (MITS)	Schaumburg	MOS 2013 Office Administration and Support

## **Appendix E: Definitions of Industries**

### **Sector 11 - Agriculture, Forestry, Fishing, and Hunting**

The Agriculture, Forestry, Fishing, and Hunting sector comprises establishments primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals from a farm, ranch, or their natural habitats.

The establishments in this sector are often described as farms, ranches, dairies, greenhouses, nurseries, orchards, or hatcheries. A farm may consist of a single tract of land or a number of separate tracts which may be held under different tenures. For example, one tract may be owned by the farm operator and another rented. It may be operated by the operator alone or with the assistance of members of the household or hired employees, or it may be operated by a partnership, corporation, or other type of organization. When a landowner has one or more tenants, renters, croppers, or managers, the land operated by each is considered a farm.

The sector distinguishes two basic activities: agricultural production and agricultural support activities. Agricultural production includes establishments performing the complete farm or ranch operation, such as farm owner-operators, tenant farm operators, and sharecroppers. Agricultural support activities include establishments that perform one or more activities associated with farm operation, such as soil preparation, planting, harvesting, and management, on a contract or fee basis.

Excluded from the Agriculture, Forestry, Fishing and Hunting sector are establishments primarily engaged in agricultural research and establishments primarily engaged in administering programs for regulating and conserving land, mineral, wildlife, and forest use. These establishments are classified in Industry 54171, Research and Development in the Physical, Engineering, and Life Sciences; and Industry 92412, Administration of Conservation Programs, respectively.

### **Sector 21 - Mining, Quarrying, and Oil and Gas Extraction**

The Mining, Quarrying, and Oil and Gas Extraction sector comprises establishments that extract naturally occurring mineral solids, such as coal and ores; liquid minerals, such as crude petroleum; and gases, such as natural gas. The term mining is used in the broad sense to include

quarrying, well operations, beneficiating (e.g., crushing, screening, washing, and flotation), and other preparation customarily performed at the mine site, or as a part of mining activity.

The Mining, Quarrying, and Oil and Gas Extraction sector distinguishes two basic activities: mine operation and mining support activities. Mine operation includes establishments operating mines, quarries, or oil and gas wells on their own account or for others on a contract or fee basis. Mining support activities include establishments that perform exploration (except geophysical surveying) and/or other mining services on a contract or fee basis (except mine site preparation and construction of oil/gas pipelines).

Establishments in the Mining, Quarrying, and Oil and Gas Extraction sector are grouped and classified according to the natural resource mined or to be mined. Industries include establishments that develop the mine site, extract the natural resources, and/or those that beneficiate (i.e., prepare) the mineral mined. Beneficiation is the process whereby the extracted material is reduced to particles that can be separated into mineral and waste, the former suitable for further processing or direct use. The operations that take place in beneficiation are primarily mechanical, such as grinding, washing, magnetic separation, and centrifugal separation. In contrast, manufacturing operations primarily use chemical and electrochemical processes, such as electrolysis and distillation. However, some treatments, such as heat treatments, take place in both the beneficiation and the manufacturing (i.e., smelting/refining) stages. The range of preparation activities varies by mineral and the purity of any given ore deposit. While some minerals, such as petroleum and natural gas, require little or no preparation, others are washed and screened, while yet others, such as gold and silver, can be transformed into bullion before leaving the mine site.

Mining, beneficiating, and manufacturing activities often occur in a single location. Separate receipts will be collected for these activities whenever possible. When receipts cannot be broken out between mining and manufacturing, establishments that mine or quarry nonmetallic minerals, and then beneficiate the nonmetallic minerals into more finished manufactured products are classified based on the primary activity of the establishment. A mine that manufactures a small amount of finished products will be classified in Sector 21, Mining, Quarrying, and Oil and Gas Extraction. An establishment that mines whose primary output is a more finished manufactured product will be classified in Sector 31-33, Manufacturing.

## **Sector 22 – Utilities**

The Utilities sector comprises establishments engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply, and sewage removal. Within this sector, the specific activities associated with the utility services provided vary by utility: electric power includes generation, transmission, and distribution; natural gas includes distribution; steam supply includes provision and/or distribution; water supply includes treatment and distribution; and sewage removal includes collection, treatment, and disposal of waste through sewer systems and sewage treatment facilities.

Excluded from this sector are establishments primarily engaged in waste management services classified in Subsector 562, Waste Management and Remediation Services. These establishments also collect, treat, and dispose of waste materials; however, they do not use sewer systems or sewage treatment facilities.

## **Sector 23 – Construction**

The Construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems). Establishments primarily engaged in the preparation of sites for new construction and establishments primarily engaged in subdividing land for sale as building sites also are included in this sector.

Construction work done may include new work, additions, alterations, or maintenance and repairs. Activities of these establishments generally are managed at a fixed place of business, but they usually perform construction activities at multiple project sites. Production responsibilities for establishments in this sector are usually specified in (1) contracts with the owners of construction projects (prime contracts) or (2) contracts with other construction establishments (subcontracts).

Establishments primarily engaged in contracts that include responsibility for all aspects of individual construction projects are commonly known as general contractors, but also may be known as design-builders, construction managers, turnkey contractors, or (in cases where two or more establishments jointly secure a general contract) joint-venture contractors. Construction managers that provide oversight and scheduling only (i.e., agency) as well as construction managers that are responsible for the entire project (i.e., at risk) are included as general contractor type establishments. Establishments of the "general contractor type" frequently

arrange construction of separate parts of their projects through subcontracts with other construction establishments.

Establishments primarily engaged in activities to produce a specific component (e.g., masonry, painting, and electrical work) of a construction project are commonly known as specialty trade contractors. Activities of specialty trade contractors are usually subcontracted from other construction establishments, but especially in remodeling and repair construction, the work may be done directly for the owner of the property.

Establishments primarily engaged in activities to construct buildings to be sold on sites that they own are known as for-sale builders, but also may be known as speculative builders or merchant builders. For-sale builders produce buildings in a manner similar to general contractors, but their production processes also include site acquisition and securing of financial backing. For-sale builders are most often associated with the construction of residential buildings. Like general contractors, they may subcontract all or part of the actual construction work on their buildings.

There are substantial differences in the types of equipment, work force skills, and other inputs required by establishments in this sector. To highlight these differences and variations in the underlying production functions, this sector is divided into three subsectors.

Subsector 236, Construction of Buildings, comprises establishments of the general contractor type and for-sale builders involved in the construction of buildings. Subsector 237, Heavy and Civil Engineering Construction, comprises establishments involved in the construction of engineering projects. Subsector 238, Specialty Trade Contractors, comprises establishments engaged in specialty trade activities generally needed in the construction of all types of buildings.

Force account construction is construction work performed by an enterprise primarily engaged in some business other than construction for its own account, using employees of the enterprise. This activity is not included in the construction sector unless the construction work performed is the primary activity of a separate establishment of the enterprise. The installation and the ongoing repair and maintenance of telecommunications and utility networks is excluded from construction when the establishments performing the work are not independent contractors. Although a growing proportion of this work is subcontracted to independent contractors in the Construction Sector, the operating units of telecommunications and utility companies performing this work are included with the telecommunications or utility activities.

### **Sector 31-33 – Manufacturing**

The Manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembling of component parts of manufactured products is considered manufacturing, except in cases where the activity is appropriately classified in Sector 23, Construction.

Establishments in the Manufacturing sector are often described as plants, factories, or mills and characteristically use power-driven machines and materials-handling equipment. However, establishments that transform materials or substances into new products by hand or in the worker's home and those engaged in selling to the general public products made on the same premises from which they are sold, such as bakeries, candy stores, and custom tailors, may also be included in this sector. Manufacturing establishments may process materials or may contract with other establishments to process their materials for them. Both types of establishments are included in manufacturing.

The materials, substances, or components transformed by manufacturing establishments are raw materials that are products of agriculture, forestry, fishing, mining, or quarrying as well as products of other manufacturing establishments. The materials used may be purchased directly from producers, obtained through customary trade channels, or secured without recourse to the market by transferring the product from one establishment to another, under the same ownership.

The new product of a manufacturing establishment may be finished in the sense that it is ready for utilization or consumption, or it may be semi-finished to become an input for an establishment engaged in further manufacturing. For example, the product of the alumina refinery is the input used in the primary production of aluminum; primary aluminum is the input to an aluminum wire drawing plant; and aluminum wire is the input for a fabricated wire product manufacturing establishment.

The subsectors in the Manufacturing sector generally reflect distinct production processes related to material inputs, production equipment, and employee skills. In the machinery area, where assembling is a key activity, parts and accessories for manufactured products are classified in the industry of the finished manufactured item when they are made for separate



sale. For example, a replacement refrigerator door would be classified with refrigerators and an attachment for a piece of metal working machinery would be classified with metal working machinery. However, components, input from other manufacturing establishments, are classified based on the production function of the component manufacturer. For example, electronic components are classified in Subsector 334, Computer and Electronic Product Manufacturing and stampings are classified in Subsector 332, Fabricated Metal Product Manufacturing.

Manufacturing establishments often perform one or more activities that are classified outside the Manufacturing sector of NAICS. For instance, almost all manufacturing has some captive research and development or administrative operations, such as accounting, payroll, or management. These captive services are treated the same as captive manufacturing activities. When the services are provided by separate establishments, they are classified to the NAICS sector where such services are primary, not in manufacturing.

The boundaries of manufacturing and the other sectors of the classification system can be somewhat blurry. The establishments in the manufacturing sector are engaged in the transformation of materials into new products. Their output is a new product. However, the definition of what constitutes a new product can be somewhat subjective. As clarification, the following activities are considered manufacturing in NAICS:

- Milk bottling and pasteurizing;
- Water bottling and processing;
- Fresh fish packaging (oyster shucking, fish filleting);
- Apparel jobbing (assigning of materials to contract factories or shops for fabrication or other contract operations) as well as contracting on materials owned by others;
- Printing and related activities;
- Ready-mixed concrete production;
- Leather converting;
- Grinding of lenses to prescription;
- Wood preserving;
- Electroplating, plating, metal heat

- treating, and polishing for the trade;
- Lapidary work for the trade;
- Fabricating signs and advertising displays;
- Rebuilding or remanufacturing
- machinery (i.e., automotive parts)
- Ship repair and renovation;
- Machine shops; and
- Tire retreading.

Conversely, there are activities that are sometimes considered manufacturing, but which for NAICS are classified in another sector (i.e., not classified as manufacturing). They include:

1. Logging, classified in Sector 11, Agriculture, Forestry, Fishing and Hunting, is considered a harvesting operation;
2. The beneficiating of ores and other minerals, classified in Sector 21, Mining, Quarrying, and Oil and Gas Extraction, is considered part of the activity of mining;
3. The construction of structures and fabricating operations performed at the site of construction by contractors, is classified in Sector 23, Construction;
4. Establishments engaged in breaking of bulk and redistribution in smaller lots, including packaging, repackaging, or bottling products, such as liquors or chemicals; the customized assembly of computers; sorting of scrap; mixing paints to customer order; and cutting metals to customer order, classified in Sector 42, Wholesale Trade or Sector 44-45, Retail Trade, produce a modified version of the same product, not a new product; and
5. Publishing and the combined activity of publishing and printing, classified in Sector 51, Information, perform the transformation of information into a product whereas the value of the product to the consumer lies in the information content, not in the format in which it is distributed (i.e., the book or software diskette).

### **Sector 42 - Wholesale Trade**

The Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing.

The wholesaling process is an intermediate step in the distribution of merchandise. Wholesalers are organized to sell or arrange the purchase or sale of (a) goods for resale (i.e., goods sold to other wholesalers or retailers), (b) capital or durable nonconsumer goods, and (c) raw and intermediate materials and supplies used in production.

Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. These warehouses and offices are characterized by having little or no display of merchandise. In addition, neither the design nor the location of the premises is intended to solicit walk-in traffic. Wholesalers do not normally use advertising directed to the general public. Customers are generally reached initially via telephone, in-person marketing, or by specialized advertising that may include Internet and other electronic means. Follow-up orders are either vendor-initiated or client-initiated, generally based on previous sales, and typically exhibit strong ties between sellers and buyers. In fact, transactions are often conducted between wholesalers and clients that have long-standing business relationships.

This sector comprises two main types of wholesalers: merchant wholesalers that sell goods on their own account and business-to-business electronic markets, agents, and brokers that arrange sales and purchases for others generally for a commission or fee.

(1) Establishments that sell goods on their own account are known as wholesale merchants, distributors, jobbers, drop shippers, and import/export merchants. Also included as wholesale merchants are sales offices and sales branches (but not retail stores) maintained by manufacturing, refining, or mining enterprises apart from their plants or mines for the purpose of marketing their products and group purchasing organizations (e.g., purchasing and selling goods on their own account). Merchant wholesale establishments typically maintain their own warehouse, where they receive and handle goods for their customers. Goods are generally sold without transformation, but may include integral functions, such as sorting, packaging, labeling, and other marketing services.

(2) Establishments arranging for the purchase or sale of goods owned by others or purchasing goods, generally on a commission basis are known as business-to-business electronic markets, agents and brokers, commission merchants, import/export agents and brokers, auction companies, group purchasing organization (e.g., purchasing or arranging for the purchases of goods owned by others), and manufacturers' representatives. These establishments operate from offices and generally do not own or handle the goods they sell.

Some wholesale establishments may be connected with a single manufacturer and promote and sell the particular manufacturers' products to a wide range of other wholesalers or retailers. Other wholesalers may be connected to a retail chain, or limited number of retail chains, and only provide a variety of products needed by that particular retail operation(s). These wholesalers may obtain the products from a wide range of manufacturers. Still other wholesalers may not take title to the goods, but act as agents and brokers for a commission.

Although, in general, wholesaling normally denotes sales in large volumes, durable nonconsumer goods may be sold in single units. Sales of capital or durable nonconsumer goods used in the production of goods and services, such as farm machinery, medium and heavy duty trucks, and industrial machinery, are always included in wholesale trade.

#### **Sector 44-45 - Retail Trade**

The Retail Trade sector comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.

The retailing process is the final step in the distribution of merchandise; retailers are, therefore, organized to sell merchandise in small quantities to the general public. This sector comprises two main types of retailers: store and non-store retailers.

1. Store retailers operate fixed point-of-sale locations, located and designed to attract a high volume of walk-in customers. In general, retail stores have extensive displays of merchandise and use mass-media advertising to attract customers. They typically sell merchandise to the general public for personal or household consumption, but some also serve business and institutional clients. These include establishments, such as office supply stores, computer and software stores, building materials dealers, plumbing supply stores, and electrical supply stores. Catalog showrooms, gasoline stations, automotive dealers, and mobile home dealers are treated as store retailers.

In addition to retailing merchandise, some types of store retailers are also engaged in the provision of after-sales services, such as repair and installation. For example, new automobile dealers, electronics and appliance stores, and musical instrument and supplies stores often

provide repair services. As a general rule, establishments engaged in retailing merchandise and providing after-sales services are classified in this sector.

The first eleven subsectors of retail trade are store retailers. The establishments are grouped into industries and industry groups typically based on one or more of the following criteria:

- (a) The merchandise line or lines carried by the store; for example, specialty stores are distinguished from general-line stores.
- (b) The usual trade designation of the establishments. This criterion applies in cases where a store type is well recognized by the industry and the public, but difficult to define strictly in terms of merchandise lines carried; for example, pharmacies, hardware stores, and department stores.
- (c) Capital requirements in terms of display equipment; for example, food stores have equipment requirements not found in other retail industries.
- (d) Human resource requirements in terms of expertise; for example, the staff of an automobile dealer requires knowledge in financing, registering, and licensing issues that are not necessary in other retail industries.

2. Non-store retailers, like store retailers, are organized to serve the general public, but their retailing methods differ. The establishments of this subsector reach customers and market merchandise with methods, such as the broadcasting of "infomercials," the broadcasting and publishing of direct-response advertising, the publishing of paper and electronic catalogs, door-to-door solicitation, in-home demonstration, selling from portable stalls (street vendors, except food), and distribution through vending machines. Establishments engaged in the direct sale (non-store) of products, such as home heating oil dealers and home delivery newspaper routes are included here.

The buying of goods for resale is a characteristic of retail trade establishments that particularly distinguishes them from establishments in the agriculture, manufacturing, and construction industries. For example, farms that sell their products at or from the point of production are not classified in retail, but rather in agriculture. Similarly, establishments that both manufacture and sell their products to the general public are not classified in retail, but

rather in manufacturing. However, establishments that engage in processing activities incidental to retailing are classified in retail. This includes establishments, such as optical goods stores that do in-store grinding of lenses, and meat and seafood markets.

Wholesalers also engage in the buying of goods for resale, but they are not usually organized to serve the general public. They typically operate from a warehouse or office and neither the design nor the location of these premises is intended to solicit a high volume of walk-in traffic. Wholesalers supply institutional, industrial, wholesale, and retail clients; their operations are, therefore, generally organized to purchase, sell, and deliver merchandise in larger quantities. However, dealers of durable non-consumer goods, such as farm machinery and heavy duty trucks, are included in wholesale trade even if they often sell these products in single units.

#### **Sector 48-49 - Transportation and Warehousing**

The Transportation and Warehousing sector includes industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation. Establishments in these industries use transportation equipment or transportation related facilities as a productive asset. The type of equipment depends on the mode of transportation. The modes of transportation are air, rail, water, road, and pipeline.

The Transportation and Warehousing sector distinguishes three basic types of activities: subsectors for each mode of transportation, a subsector for warehousing and storage, and a subsector for establishments providing support activities for transportation. In addition, there are subsectors for establishments that provide passenger transportation for scenic and sightseeing purposes, postal services, and courier services.

A separate subsector for support activities is established in the sector because, first, support activities for transportation are inherently multimodal, such as freight transportation arrangement, or have multimodal aspects. Secondly, there are production process similarities among the support activity industries.

One of the support activities identified in the support activity subsector is the routine repair and maintenance of transportation equipment (e.g., aircraft at an airport, railroad rolling stock at a

railroad terminal, or ships at a harbor or port facility). Such establishments do not perform complete overhauling or rebuilding of transportation equipment (i.e., periodic restoration of transportation equipment to original design specifications) or transportation equipment conversion (i.e., major modification to systems). An establishment that primarily performs factory (or shipyard) overhauls, rebuilding, or conversions of aircraft, railroad rolling stock, or a ship is classified in Subsector 336, Transportation Equipment Manufacturing according to the type of equipment.

Many of the establishments in this sector often operate on networks, with physical facilities, labor forces, and equipment spread over an extensive geographic area.

Warehousing establishments in this sector are distinguished from merchant wholesaling in that the warehouse establishments do not sell the goods.

Excluded from this sector are establishments primarily engaged in providing travel agent services that support transportation and other establishments, such as hotels, businesses, and government agencies. These establishments are classified in Sector 56, Administrative and Support and Waste Management and Remediation Services. Also, establishments primarily engaged in providing rental and leasing of transportation equipment without operator are classified in Subsector 532, Rental and Leasing Services.

### **Sector 51 – Information**

The Information sector comprises establishments engaged in the following processes: (a) producing and distributing information and cultural products, (b) providing the means to transmit or distribute these products as well as data or communications, and (c) processing data.

The main components of this sector are the publishing industries, including software publishing, and both traditional publishing and publishing exclusively on the Internet; the motion picture and sound recording industries; the broadcasting industries, including traditional broadcasting and those broadcasting exclusively over the Internet; the telecommunications industries; Web search portals, data processing industries, and the information services industries.

The expressions "information age" and "global information economy" are used with considerable frequency today. The general idea of an "information economy" includes both the notion of industries primarily producing, processing, and distributing information, as well as the idea that

every industry is using available information and information technology to reorganize and make themselves more productive.

For the purposes of NAICS, it is the transformation of information into a commodity that is produced and distributed by a number of growing industries that is at issue. The Information sector groups three types of establishments: (1) those engaged in producing and distributing information and cultural products; (2) those that provide the means to transmit or distribute these products as well as data or communications; and (3) those that process data. Cultural products are those that directly express attitudes, opinions, ideas, values, and artistic creativity; provide entertainment; or offer information and analysis concerning the past and present. Included in this definition are popular, mass-produced products as well as cultural products that normally have a more limited audience, such as poetry books, literary magazines, or classical records.

The unique characteristics of information and cultural products, and of the processes involved in their production and distribution, distinguish the Information sector from the goods-producing and service-producing sectors. Some of these characteristics are:

Unlike traditional goods, an "information or cultural product," such as a newspaper on-line or television program, does not necessarily have tangible qualities, nor is it necessarily associated with a particular form. A movie can be shown at a movie theater, on a television broadcast, through video-on-demand or rented at a local video store. A sound recording can be aired on radio, embedded in multimedia products, or sold at a record store.

Unlike traditional services, the delivery of these products does not require direct contact between the supplier and the consumer.

3. The value of these products to the consumer lies in their informational, educational, cultural, or entertainment content, not in the format in which they are distributed. Most of these products are protected from unlawful reproduction by copyright laws.

4. The intangible property aspect of information and cultural products makes the processes involved in their production and distribution very different from goods and services. Only those possessing the rights to these works are authorized to reproduce, alter, improve, and distribute them. Acquiring and using these rights often involves significant costs. In addition, technology is revolutionizing the distribution of these products. It is possible to distribute them in a physical form, via broadcast, or on-line.



5. Distributors of information and cultural products can easily add value to the products they distribute. For instance, broadcasters add advertising not contained in the original product. This capacity means that unlike traditional distributors, they derive revenue not from sale of the distributed product to the final consumer, but from those who pay for the privilege of adding information to the original product. Similarly, a directory and mailing list publisher can acquire the rights to thousands of previously published newspaper and periodical articles and add new value by providing search and software and organizing the information in a way that facilitates research and retrieval. These products often command a much higher price than the original information.

The distribution modes for information commodities may either eliminate the necessity for traditional manufacture, or reverse the conventional order of manufacture-distribute: A newspaper distributed on-line, for example, can be printed locally or by the final consumer. Similarly, it is anticipated that packaged software, which today is mainly bought through the traditional retail channels, will soon be available mainly on-line. The NAICS Information sector is designed to make such economic changes transparent as they occur, or to facilitate designing surveys that will monitor the new phenomena and provide data to analyze the changes.

Many of the industries in the NAICS Information sector are engaged in producing products protected by copyright law, or in distributing them (other than distribution by traditional wholesale and retail methods). Examples are traditional publishing industries, software and directory and mailing list publishing industries, and film and sound industries. Broadcasting and telecommunications industries and information providers and processors are also included in the Information sector, because their technologies are so closely linked to other industries in the Information sector.

### **Sector 52 - Finance and Insurance**

The Finance and Insurance sector comprises establishments primarily engaged in financial transactions (transactions involving the creation, liquidation, or change in ownership of financial assets) and/or in facilitating financial transactions. Three principal types of activities are identified:

Raising funds by taking deposits and/or issuing securities and, in the process, incurring liabilities. Establishments engaged in this activity use raised funds to acquire financial assets by making

loans and/or purchasing securities. Putting themselves at risk, they channel funds from lenders to borrowers and transform or repackage the funds with respect to maturity, scale, and risk. This activity is known as financial intermediation.

2. Pooling of risk by underwriting insurance and annuities. Establishments engaged in this activity collect fees, insurance premiums, or annuity considerations; build up reserves; invest those reserves; and make contractual payments. Fees are based on the expected incidence of the insured risk and the expected return on investment.

3. Providing specialized services facilitating or supporting financial intermediation, insurance, and employee benefit programs.

In addition, monetary authorities charged with monetary control are included in this sector.

The subsectors, industry groups, and industries within the NAICS Finance and Insurance sector are defined on the basis of their unique production processes. As with all industries, the production processes are distinguished by their use of specialized human resources and specialized physical capital. In addition, the way in which these establishments acquire and allocate financial capital, their source of funds, and the use of those funds provides a third basis for distinguishing characteristics of the production process. For instance, the production process in raising funds through deposit-taking is different from the process of raising funds in bond or money markets. The process of making loans to individuals also requires different production processes than does the creation of investment pools or the underwriting of securities.

Most of the Finance and Insurance subsectors contain one or more industry groups of (1) intermediaries with similar patterns of raising and using funds and (2) establishments engaged in activities that facilitate, or are otherwise related to, that type of financial or insurance intermediation. Industries within this sector are defined in terms of activities for which a production process can be specified, and many of these activities are not exclusive to a particular type of financial institution. To deal with the varied activities taking place within existing financial institutions, the approach is to split these institutions into components performing specialized services. This requires defining the units engaged in providing those services and developing procedures that allow for their delineation. These units are the equivalents for finance and insurance of the establishments defined for other industries.

The output of many financial services, as well as the inputs and the processes by which they are combined, cannot be observed at a single location and can only be defined at a higher level of the organizational structure of the enterprise. Additionally, a number of independent activities that represent separate and distinct production processes may take place at a single location belonging to a multi-location financial firm. Activities are more likely to be homogeneous with respect to production characteristics than are locations, at least in financial services. The classification defines activities broadly enough that it can be used both by those classifying by location and by those employing a more top-down approach to the delineation of the establishment.

Establishments engaged in activities that facilitate, or are otherwise related to, the various types of intermediation have been included in individual subsectors, rather than in a separate subsector dedicated to services alone because these services are performed by intermediaries, as well as by specialist establishments, the extent to which the activity of the intermediaries can be separately identified is not clear.

The Finance and Insurance sector has been defined to encompass establishments primarily engaged in financial transactions; that is, transactions involving the creation, liquidation, change in ownership of financial assets; or in facilitating financial transactions. Financial industries are extensive users of electronic means for facilitating the verification of financial balances, authorizing transactions, transferring funds to and from transactors' accounts, notifying banks (or credit card issuers) of the individual transactions, and providing daily summaries. Since these transaction processing activities are integral to the production of finance and insurance services, establishments that principally provide a financial transaction processing service are classified to this sector, rather than to the data processing industry in the Information sector.

Legal entities that hold portfolios of assets on behalf of others are significant and data on them are required for a variety of purposes. Thus for NAICS, these funds, trusts, and other financial vehicles are the fifth subsector of the Finance and Insurance sector. These entities earn interest, dividends, and other property income, but have little or no employment and no revenue from the sale of services. Separate establishments and employees devoted to the management of funds are classified in Industry Group 5239, Other Financial Investment Activities.

### **Sector 53 - Real Estate and Rental and Leasing**

The Real Estate and Rental and Leasing sector comprises establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services. The major portion of this sector comprises establishments that rent, lease, or otherwise allow the use of their own assets by others. The assets may be tangible, as is the case of real estate and equipment, or intangible, as is the case with patents and trademarks.

This sector also includes establishments primarily engaged in managing real estate for others, selling, renting and/or buying real estate for others, and appraising real estate. These activities are closely related to this sector's main activity, and it was felt that from a production basis they would best be included here. In addition, a substantial proportion of property management is self-performed by lessors.

The main components of this sector are the real estate lessors industries (including equity real estate investment trusts (REITs)); equipment lessors industries (including motor vehicles, computers, and consumer goods); and lessors of nonfinancial intangible assets (except copyrighted works).

Excluded from this sector are establishments primarily engaged in renting or leasing equipment with operators. Establishments renting or leasing equipment with operators are classified in various subsectors of NAICS depending on the nature of the services provided (e.g., transportation, construction, agriculture). These activities are excluded from this sector because the client is paying for the expertise and knowledge of the equipment operator, in addition to the rental of the equipment. In many cases, such as the rental of heavy construction equipment, the operator is essential to operate the equipment.

### **Sector 54 - Professional, Scientific, and Technical Services**

The Professional, Scientific, and Technical Services sector comprises establishments that specialize in performing professional, scientific, and technical activities for others. These activities require a high degree of expertise and training. The establishments in this sector specialize according to expertise and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: legal advice and representation; accounting, bookkeeping, and payroll services; architectural, engineering, and specialized design services;

computer services; consulting services; research services; advertising services; photographic services; translation and interpretation services; veterinary services; and other professional, scientific, and technical services.

This sector excludes establishments primarily engaged in providing a range of day-to-day office administrative services, such as financial planning, billing and recordkeeping, personnel, and physical distribution and logistics. These establishments are classified in Sector 56, Administrative and Support and Waste Management and Remediation Services.

### **Sector 55 - Management of Companies and Enterprises**

The Management of Companies and Enterprises sector comprises (1) establishments that hold the securities of (or other equity interests in) companies and enterprises for the purpose of owning a controlling interest or influencing management decisions or (2) establishments (except government establishments) that administer, oversee, and manage establishments of the company or enterprise and that normally undertake the strategic or organizational planning and decision making role of the company or enterprise. Establishments that administer, oversee, and manage may hold the securities of the company or enterprise.

Establishments in this sector perform essential activities that are often undertaken in-house by establishments in many sectors of the economy. By consolidating the performance of these activities of the enterprise at one establishment, economies of scale are achieved.

Government establishments primarily engaged in administering, overseeing, and managing governmental programs are classified in Sector 92, Public Administration. Establishments primarily engaged in providing a range of day-to-day office administrative services, such as financial planning, billing and recordkeeping, personnel, and physical distribution and logistics are classified in Industry 56111, Office Administrative Services.

### **Sector 56 - Administrative and Support and Waste Management and Remediation Services**

The Administrative and Support and Waste Management and Remediation Services sector comprises establishments performing routine support activities for the day-to-day operations of other organizations. These essential activities are often undertaken in-house by establishments in many sectors of the economy. The establishments in this sector specialize in one or more of these

support activities and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services.

The administrative and management activities performed by establishments in this sector are typically on a contract or fee basis. These activities may also be performed by establishments that are part of the company or enterprise. However, establishments involved in administering, overseeing, and managing other establishments of the company or enterprise, are classified in Sector 55, Management of Companies and Enterprises. Establishments in Sector 55 normally undertake the strategic and organizational planning and decision making role of the company or enterprise. Government establishments engaged in administering, overseeing, and managing governmental programs are classified in Sector 92, Public Administration.

### **Sector 61 - Educational Services**

The Educational Services sector comprises establishments that provide instruction and training in a wide variety of subjects. This instruction and training is provided by specialized establishments, such as schools, colleges, universities, and training centers. These establishments may be privately owned and operated for profit or not for profit, or they may be publicly owned and operated. They may also offer food and/or accommodation services to their students.

Educational services are usually delivered by teachers or instructors that explain, tell, demonstrate, supervise, and direct learning. Instruction is imparted in diverse settings, such as educational institutions, the workplace, or the home, and through diverse means, such as correspondence, television, the Internet, or other electronic and distance-learning methods. The training provided by these establishments may include the use of simulators and simulation methods. It can be adapted to the particular needs of the students, for example sign language can replace verbal language for teaching students with hearing impairments. All industries in the sector share this commonality of process, namely, labor inputs of instructors with the requisite subject matter expertise and teaching ability.

### **Sector 62 - Health Care and Social Assistance**

The Health Care and Social Assistance sector comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance

because it is sometimes difficult to distinguish between the boundaries of these two activities. The industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry.

Excluded from this sector are aerobic classes in Subsector 713, Amusement, Gambling and Recreation Industries and nonmedical diet and weight reducing centers in Subsector 812, Personal and Laundry Services. Although these can be viewed as health services, these services are not typically delivered by health practitioners.

### **Sector 71 - Arts, Entertainment, and Recreation**

The Arts, Entertainment, and Recreation sector includes a wide range of establishments that operate facilities or provide services to meet varied cultural, entertainment, and recreational interests of their patrons. This sector comprises (1) establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) establishments that preserve and exhibit objects and sites of historical, cultural, or educational interest; and (3) establishments that operate facilities or provide services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure-time interests.

Some establishments that provide cultural, entertainment, or recreational facilities and services are classified in other sectors. Excluded from this sector are: (1) establishments that provide both accommodations and recreational facilities, such as hunting and fishing camps and resort and casino hotels are classified in Subsector 721, Accommodation; (2) restaurants and night clubs that provide live entertainment in addition to the sale of food and beverages are classified in Subsector 722, Food Services and Drinking Places; (3) motion picture theaters, libraries and archives, and publishers of newspapers, magazines, books, periodicals, and computer software are classified in Sector 51, Information; and (4) establishments using transportation equipment to provide recreational and entertainment services, such as those operating sightseeing buses, dinner cruises, or helicopter rides, are classified in Subsector 487, Scenic and Sightseeing Transportation.

**Sector 72 - Accommodation and Food Services**

The Accommodation and Food Services sector comprises establishments providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption. The sector includes both accommodation and food services establishments because the two activities are often combined at the same establishment.

Excluded from this sector are civic and social organizations; amusement and recreation parks; theaters; and other recreation or entertainment facilities providing food and beverage services.

**Sector 81 - Other Services (except Public Administration)**

The Other Services (except Public Administration) sector comprises establishments engaged in providing services not specifically provided for elsewhere in the classification system. Establishments in this sector are primarily engaged in activities such as equipment and machinery repairing, promoting or administering religious activities, grant making, advocacy, and providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

Private households that engage in employing workers on or about the premises in activities primarily concerned with the operation of the household are included in this sector. Excluded from this sector are establishments primarily engaged in retailing new equipment and also performing repairs and general maintenance on equipment. These establishments are classified in Sector 44-45, Retail Trade.

**Sector 92 - Public Administration**

The Public Administration sector consists of establishments of federal, state, and local government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area. These agencies also set policy, create laws, adjudicate civil and criminal legal cases, provide for public safety and for national defense. In general, government establishments in the Public Administration sector oversee governmental programs and activities that are not performed by private establishments. Establishments in this sector typically are engaged in the organization and financing of the production of public goods and services, most of which are provided for free or at prices that are not economically significant.



Government establishments also engage in a wide range of productive activities covering not only public goods and services but also individual goods and services similar to those produced in sectors typically identified with private-sector establishments. In general, ownership is not a criterion for classification in NAICS. Therefore, government establishments engaged in the production of private-sector-like goods and services should be classified in the same industry as private-sector establishments engaged in similar activities.

As a practical matter, it is difficult to identify separate establishment detail for many government agencies. To the extent that separate establishment records are available, the administration of governmental programs is classified in Sector 92, Public Administration, while the operation of that same governmental program is classified elsewhere in NAICS based on the activities performed. For example, the governmental administrative authority for an airport is classified in Industry 92612, Regulation and Administration of Transportation Programs, while operating the airport is classified in Industry 48811, Airport Operations. When separate records for multi-establishment companies are not available to distinguish between the administration of a governmental program and the operation of it, the establishment is classified in Sector 92, Public Administration.

Examples of government-provided goods and services that are classified in sectors other than Public Administration include: schools, classified in Sector 61, Educational Services; hospitals, classified in Subsector 622, Hospitals; establishments operating transportation facilities, classified in Sector 48-49, Transportation and Warehousing; the operation of utilities, classified in Sector 22, Utilities; and the Government Printing Office, classified in Subsector 323, Printing and Related Support Activities.

## **Appendix F: List of 6-Digit Occupation Code Definitions**

### **11-1011 Chief Executives**

Determine and formulate policies and provide overall direction of companies or private and public sector organizations within guidelines set up by a board of directors or similar governing body. Plan, direct, or coordinate operational activities at the highest level of management with the help of subordinate executives and staff managers.

### **11-1021 General and Operations Managers**

Plan, direct, or coordinate the operations of public or private sector organizations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services. Excludes First-Line Supervisors.

### **11-1031 Legislators**

Develop, introduce or enact laws and statutes at the local, tribal, State, or Federal level. Includes only workers in elected positions.

### **11-2011 Advertising and Promotions Managers**

Plan, direct, or coordinate advertising policies and programs or produce collateral materials, such as posters, contests, coupons, or giveaways, to create extra interest in the purchase of a product or service for a department, an entire organization, or on an account basis.

### **11-2021 Marketing Managers**

Plan, direct, or coordinate marketing policies and programs, such as determining the demand for products and services offered by a firm and its competitors, and identify potential customers. Develop pricing strategies with the goal of maximizing the firm's profits or share of the market while ensuring the firm's customers are satisfied. Oversee product development or monitor trends that indicate the need for new products and services.

### **11-2022 Sales Managers**

Plan, direct, or coordinate the actual distribution or movement of a product or service to the customer. Coordinate sales distribution by establishing sales territories, quotas, and goals and establish training programs for sales representatives. Analyze sales statistics gathered by staff to determine sales potential and inventory requirements and monitor the preferences of customers.

### **11-2031 Public Relations and Fundraising Managers**

Plan, direct, or coordinate activities designed to create or maintain a favorable public image or raise issue awareness for their organization or client; or if engaged in fundraising, plan, direct, or coordinate activities to solicit and maintain funds for special projects or nonprofit organizations.

#### 11-3011 Administrative Services Managers

Plan, direct, or coordinate one or more administrative services of an organization, such as records and information management, mail distribution, facilities planning and maintenance, custodial operations, and other office support services. Medical records administrators are included in "Medical and Health Services Managers" (11-9111). Excludes "Purchasing Managers" (11-3061).

#### 11-3021 Computer and Information Systems Managers

Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming. Excludes "Computer Occupations" (15-1111 through 15-1199).

#### 11-3031 Financial Managers

Plan, direct, or coordinate accounting, investing, banking, insurance, securities, and other financial activities of a branch, office, or department of an establishment.

#### 11-3051 Industrial Production Managers

Plan, direct, or coordinate the work activities and resources necessary for manufacturing products in accordance with cost, quality, and quantity specifications.

#### 11-3061 Purchasing Managers

Plan, direct, or coordinate the activities of buyers, purchasing officers, and related workers involved in purchasing materials, products, and services. Includes wholesale or retail trade merchandising managers and procurement managers.

#### 11-3071 Transportation, Storage, and Distribution Managers

Plan, direct, or coordinate transportation, storage, or distribution activities in accordance with organizational policies and applicable government laws or regulations. Includes logistics managers.

#### 11-3111 Compensation and Benefits Managers

Plan, direct, or coordinate compensation and benefits activities of an organization. Job analysis and position description managers are included in "Human Resource Managers" (11-3121).

#### 11-3121 Human Resources Managers

Plan, direct, or coordinate human resources activities and staff of an organization. Excludes managers who primarily focus on compensation and benefits (11-3111) and training and development (11-3131).

#### 11-3131 Training and Development Managers

Plan, direct, or coordinate the training and development activities and staff of an organization.

#### 11-9013 Farmers, Ranchers, and Other Agricultural Managers

Plan, direct, or coordinate the management or operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts, or other agricultural establishments. May hire, train, and supervise farm workers or contract for services to carry out the day-to-day activities of the managed operation. May engage in or supervise planting, cultivating, harvesting, and financial and marketing activities. Excludes "First-Line Supervisors of Farming, Fishing, and Forestry Workers" (45-1011).

#### 11-9021 Construction Managers

Plan, direct, or coordinate, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures, facilities, and systems. Participate in the conceptual development of a construction project and oversee its organization, scheduling, budgeting, and implementation. Includes managers in specialized construction fields, such as carpentry or plumbing.

#### 11-9031 Education Administrators, Preschool and Childcare Center/Program

Plan, direct, or coordinate the academic and nonacademic activities of preschool and childcare centers or programs. Excludes "Preschool Teachers" (25-2011).

#### 11-9032 Education Administrators, Elementary and Secondary School

Plan, direct, or coordinate the academic, administrative, or auxiliary activities of public or private elementary or secondary level schools.

#### 11-9033 Education Administrators, Postsecondary

Plan, direct, or coordinate research, instructional, student administration and services, and other educational activities at postsecondary institutions, including universities, colleges, and junior and community colleges.

#### 11-9039 Education Administrators, All Other

All education administrators not listed separately.

#### 11-9041 Architectural and Engineering Managers

Plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields. Excludes "Natural Sciences Managers" (11-9121).

#### 11-9051 Food Service Managers

Plan, direct, or coordinate activities of an organization or department that serves food and beverages. Excludes "Chefs and Head Cooks" (35-1011).

#### 11-9061 Funeral Service Managers

Plan, direct, or coordinate the services or resources of funeral homes. Includes activities such as determining prices for services or merchandise and managing the facilities of funeral homes. Excludes "Morticians, Undertakers, and Funeral Directors" (39-4031).

#### 11-9071 Gaming Managers

Plan, direct, or coordinate gaming operations in a casino. May formulate house rules.

#### 11-9081 Lodging Managers

Plan, direct, or coordinate activities of an organization or department that provides lodging and other accommodations. Excludes "Food Service Managers" (11-9051) in lodging establishments.

#### 11-9111 Medical and Health Services Managers

Plan, direct, or coordinate medical and health services in hospitals, clinics, managed care organizations, public health agencies, or similar organizations.

#### 11-9121 Natural Sciences Managers

Plan, direct, or coordinate activities in such fields as life sciences, physical sciences, mathematics, statistics, and research and development in these fields. Excludes "Architecture and Engineering Managers" (11-9041) and "Computer and Information Systems Managers" (11-3021).

#### 11-9131 Postmasters and Mail Superintendents

Plan, direct, or coordinate operational, administrative, management, and supportive services of a U.S. post office; or coordinate activities of workers engaged in postal and related work in assigned post office.

#### 11-9141 Property, Real Estate, and Community Association Managers

Plan, direct, or coordinate the selling, buying, leasing, or governance activities of commercial, industrial, or residential real estate properties. Includes managers of homeowner and condominium associations, rented or leased housing units, buildings, or land (including rights-of-way).

#### 11-9151 Social and Community Service Managers

Plan, direct, or coordinate the activities of a social service program or community outreach organization. Oversee the program or organization's budget and policies regarding participant involvement, program requirements, and benefits. Work may involve directing social workers, counselors, or probation officers.

#### 11-9161 Emergency Management Directors

Plan and direct disaster response or crisis management activities, provide disaster preparedness training, and prepare emergency plans and procedures for natural (e.g., hurricanes, floods, earthquakes), wartime, or technological (e.g., nuclear power plant emergencies or hazardous materials spills) disasters or hostage situations.

#### 11-9199 Managers, All Other

All managers not listed separately.

#### 13-1011 Agents and Business Managers of Artists, Performers, and Athletes

Represent and promote artists, performers, and athletes in dealings with current or prospective employers. May handle contract negotiation and other business matters for clients.

#### 13-1021 Buyers and Purchasing Agents, Farm Products

Purchase farm products either for further processing or resale. Includes tree farm contractors, grain brokers and market operators, grain buyers, and tobacco buyers.

#### 13-1022 Wholesale and Retail Buyers, Except Farm Products

Buy merchandise or commodities, other than farm products, for resale to consumers at the wholesale or retail level, including both durable and nondurable goods. Analyze past buying trends, sales records, price, and quality of merchandise to determine value and yield. Select, order, and authorize payment for merchandise according to contractual agreements. May conduct meetings with sales personnel and introduce new products. Includes assistant wholesale and retail buyers of nonfarm products.

#### 13-1023 Purchasing Agents, Except Wholesale, Retail, and Farm Products

Purchase machinery, equipment, tools, parts, supplies, or services necessary for the operation of an establishment. Purchase raw or semi-finished materials for manufacturing. Excludes "Buyers and Purchasing Agents, Farm Products" (13-1021) and "Wholesale and Retail Buyers, Except Farm Products" (13-1022).

#### 13-1031 Claims Adjusters, Examiners, and Investigators

Review settled claims to determine that payments and settlements are made in accordance with company practices and procedures. Confer with legal counsel on claims requiring litigation. May also settle insurance claims. Excludes "Fire Inspectors and Investigators" (33-2021).

#### 13-1032 Insurance Appraisers, Auto Damage

Appraise automobile or other vehicle damage to determine repair costs for insurance claim settlement. Prepare insurance forms to indicate repair cost or cost estimates and recommendations. May seek agreement with automotive repair shop on repair costs.

### 13-1041 Compliance Officers

Examine, evaluate, and investigate eligibility for or conformity with laws and regulations governing contract compliance of licenses and permits, and perform other compliance and enforcement inspection and analysis activities not classified elsewhere. Excludes "Financial Examiners" (13-2061), "Tax Examiners and Collectors, and Revenue Agents" (13-2081), "Occupational Health and Safety Specialists" (29-9011), "Occupational Health and Safety Technicians" (29-9012), "Transportation Security Screeners" (33-9093), "Agricultural Inspectors" (45-2011), "Construction and Building Inspectors" (47-4011), and "Transportation Inspectors" (53-6051).

### 13-1051 Cost Estimators

Prepare cost estimates for product manufacturing, construction projects, or services to aid management in bidding on or determining price of product or service. May specialize according to particular service performed or type of product manufactured.

### 13-1071 Human Resources Specialists

Perform activities in the human resource area. Includes employment specialists who screen, recruit, interview, and place workers. Excludes "Compensation, Benefits, and Job Analysis Specialists" (13-1141) and "Training and Development Specialists" (13-1151).

### 13-1074 Farm Labor Contractors

Recruit and hire seasonal or temporary agricultural laborers. May transport, house, and provide meals for workers.

### 13-1075 Labor Relations Specialists

Resolve disputes between workers and managers, negotiate collective bargaining agreements, or coordinate grievance procedures to handle employee complaints. Excludes equal employment opportunity (EEO) officers who are included in "Compliance Officers" (13-1041).

### 13-1081 Logisticians

Analyze and coordinate the logistical functions of a firm or organization. Responsible for the entire life cycle of a product, including acquisition, distribution, internal allocation, delivery, and final disposal of resources. Excludes "Transportation, Storage, and Distribution Managers" (11-3071).

### 13-1111 Management Analysts

Conduct organizational studies and evaluations, design systems and procedures, conduct work simplification and measurement studies, and prepare operations and procedures manuals to assist management in operating more efficiently and effectively. Includes program analysts and management consultants. Excludes "Computer Systems Analysts" (15-1121) and "Operations Research Analysts" (15-2031).

#### 13-1121 Meeting, Convention, and Event Planners

Coordinate activities of staff, convention personnel, or clients to make arrangements for group meetings, events, or conventions.

#### 13-1131 Fundraisers

Organize activities to raise funds or otherwise solicit and gather monetary donations or other gifts for an organization. May design and produce promotional materials. May also raise awareness of the organization's work, goals, and financial needs.

#### 13-1141 Compensation, Benefits, and Job Analysis Specialists

Conduct programs of compensation and benefits and job analysis for employer. May specialize in specific areas, such as position classification and pension programs.

#### 13-1151 Training and Development Specialists

Design and conduct training and development programs to improve individual and organizational performance. May analyze training needs.

#### 13-1161 Market Research Analysts and Marketing Specialists

Research market conditions in local, regional, or national areas, or gather information to determine potential sales of a product or service, or create a marketing campaign. May gather information on competitors, prices, sales, and methods of marketing and distribution.

#### 13-1199 Business Operations Specialists, All Other

All business operations specialists not listed separately.

#### 13-2011 Accountants and Auditors

Examine, analyze, and interpret accounting records to prepare financial statements, give advice, or audit and evaluate statements prepared by others. Install or advise on systems of recording costs or other financial and budgetary data. Excludes "Tax Examiners and Collectors, and Revenue Agents" (13-2081).

#### 13-2021 Appraisers and Assessors of Real Estate

Appraise real property and estimate its fair value. May assess taxes in accordance with prescribed schedules.

#### 13-2031 Budget Analysts

Examine budget estimates for completeness, accuracy, and conformance with procedures and regulations. Analyze budgeting and accounting reports.



#### 13-2041 Credit Analysts

Analyze credit data and financial statements of individuals or firms to determine the degree of risk involved in extending credit or lending money. Prepare reports with credit information for use in decision making.

#### 13-2051 Financial Analysts

Conduct quantitative analyses of information affecting investment programs of public or private institutions.

#### 13-2052 Personal Financial Advisors

Advise clients on financial plans using knowledge of tax and investment strategies, securities, insurance, pension plans, and real estate. Duties include assessing clients' assets, liabilities, cash flow, insurance coverage, tax status, and financial objectives.

#### 13-2053 Insurance Underwriters

Review individual applications for insurance to evaluate degree of risk involved and determine acceptance of applications.

#### 13-2061 Financial Examiners

Enforce or ensure compliance with laws and regulations governing financial and securities institutions and financial and real estate transactions. May examine, verify, or authenticate records.

#### 13-2071 Credit Counselors

Advise and educate individuals or organizations on acquiring and managing debt. May provide guidance in determining the best type of loan and explaining loan requirements or restrictions. May help develop debt management plans, advise on credit issues, or provide budget, mortgage, and bankruptcy counseling.

#### 13-2072 Loan Officers

Evaluate, authorize, or recommend approval of commercial, real estate, or credit loans. Advise borrowers on financial status and payment methods. Includes mortgage loan officers and agents, collection analysts, loan servicing officers, and loan underwriters.

#### 13-2081 Tax Examiners and Collectors, and Revenue Agents

Determine tax liability or collect taxes from individuals or business firms according to prescribed laws and regulations.

#### 13-2082 Tax Preparers

Prepare tax returns for individuals or small businesses. Excludes "Accountants and Auditors" (13-2011).

### 13-2099 Financial Specialists, All Other

All financial specialists not listed separately.

### 15-1111 Computer and Information Research Scientists

Conduct research into fundamental computer and information science as theorists, designers, or inventors. Develop solutions to problems in the field of computer hardware and software.

### 15-1121 Computer Systems Analysts

Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software.

### 15-1122 Information Security Analysts

Plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. May ensure appropriate security controls are in place that will safeguard digital files and vital electronic infrastructure. May respond to computer security breaches and viruses. Excludes "Computer Network Architects" (15-1143).

### 15-1131 Computer Programmers

Create, modify, and test the code, forms, and script that allow computer applications to run. Work from specifications drawn up by software developers or other individuals. May assist software developers by analyzing user needs and designing software solutions. May develop and write computer programs to store, locate, and retrieve specific documents, data, and information.

### 15-1132 Software Developers, Applications

Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. May supervise computer programmers.

### 15-1133 Software Developers, Systems Software

Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. May design embedded systems software. Apply principles and techniques of computer science, engineering, and mathematical analysis.

#### 15-1134 Web Developers

Design, create, and modify Web sites. Analyze user needs to implement Web site content, graphics, performance, and capacity. May integrate Web sites with other computer applications. May convert written, graphic, audio, and video components to compatible Web formats by using software designed to facilitate the creation of Web and multimedia content. Excludes "Multimedia Artists and Animators" (27-1014).

#### 15-1141 Database Administrators

Administer, test, and implement computer databases, applying knowledge of database management systems. Coordinate changes to computer databases. May plan, coordinate, and implement security measures to safeguard computer databases. Excludes "Information Security Analysts" (15-1122).

#### 15-1142 Network and Computer Systems Administrators

Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Monitor network to ensure network availability to all system users and may perform necessary maintenance to support network availability. May monitor and test Web site performance to ensure Web sites operate correctly and without interruption. May assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software. May supervise computer user support specialists and computer network support specialists. May administer network security measures. Excludes "Information Security Analysts" (15-1122), "Computer User Support Specialists" (15-1151), and "Computer Network Support Specialists" (15-1152).

#### 15-1143 Computer Network Architects

Design and implement computer and information networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. Perform network modeling, analysis, and planning. May also design network and computer security measures. May research and recommend network and data communications hardware and software. Excludes "Information Security Analysts" (15-1122), "Network and Computer Systems Administrators" (15-1142), and "Computer Network Support Specialists" (15-1152).

#### 15-1151 Computer User Support Specialists

Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, or via telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Excludes "Network and Computer Systems Administrators" (15-1142).

#### 15-1152 Computer Network Support Specialists

Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption. Excludes "Network and Computer Systems Administrators" (15-1142) and "Computer Network Architects" (15-1143).

#### 15-1199 Computer Occupations, All Other

All computer occupations not listed separately. Excludes "Computer and Information Systems Managers" (11-3021), "Computer Hardware Engineers" (17-2061), "Electrical and Electronics Engineers" (17-2070), "Computer Science Teachers, Postsecondary" (25-1021), "Multimedia Artists and Animators" (27-1014), "Graphic Designers" (27-1024), "Computer Operators" (43-9011), and "Computer, Automated Teller, and Office Machine Repairs" (49-2011).

#### 15-2011 Actuaries

Analyze statistical data, such as mortality, accident, sickness, disability, and retirement rates and construct probability tables to forecast risk and liability for payment of future benefits. May ascertain insurance rates required and cash reserves necessary to ensure payment of future benefits.

#### 15-2021 Mathematicians

Conduct research in fundamental mathematics or in application of mathematical techniques to science, management, and other fields. Solve problems in various fields using mathematical methods.

#### 15-2031 Operations Research Analysts

Formulate and apply mathematical modeling and other optimizing methods to develop and interpret information that assists management with decision making, policy formulation, or other managerial functions. May collect and analyze data and develop decision support software, service, or products. May develop and supply optimal time, cost, or logistics networks for program evaluation, review, or implementation.

#### 15-2041 Statisticians

Develop or apply mathematical or statistical theory and methods to collect, organize, interpret, and summarize numerical data to provide usable information. May specialize in fields such as bio-statistics, agricultural statistics, business statistics, or economic statistics. Includes mathematical and survey statisticians. Excludes "Survey Researchers" (19-3022).

#### 15-2091 Mathematical Technicians

Apply standardized mathematical formulas, principles, and methodology to technological problems in engineering and physical sciences in relation to specific industrial and research objectives, processes, equipment, and products.

**15-2099 Mathematical Science Occupations, All Other**

All mathematical scientists not listed separately.

**17-1011 Architects, Except Landscape and Naval**

Plan and design structures, such as private residences, office buildings, theaters, factories, and other structural property. Excludes "Landscape Architects" (17-1012) and "Marine Engineers and Naval Architects" (17-2121).

**17-1012 Landscape Architects**

Plan and design land areas for projects such as parks and other recreational facilities, airports, highways, hospitals, schools, land subdivisions, and commercial, industrial, and residential sites.

**17-1021 Cartographers and Photogrammetrists**

Collect, analyze, and interpret geographic information provided by geodetic surveys, aerial photographs, and satellite data. Research, study, and prepare maps and other spatial data in digital or graphic form for legal, social, political, educational, and design purposes. May work with Geographic Information Systems (GIS). May design and evaluate algorithms, data structures, and user interfaces for GIS and mapping systems.

**17-1022 Surveyors**

Make exact measurements and determine property boundaries. Provide data relevant to the shape, contour, gravitation, location, elevation, or dimension of land or land features on or near the earth's surface for engineering, mapmaking, mining, land evaluation, construction, and other purposes.

**17-2011 Aerospace Engineers**

Perform engineering duties in designing, constructing, and testing aircraft, missiles, and spacecraft. May conduct basic and applied research to evaluate adaptability of materials and equipment to aircraft design and manufacture. May recommend improvements in testing equipment and techniques.

**17-2021 Agricultural Engineers**

Apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products.

**17-2031 Biomedical Engineers**

Apply knowledge of engineering, biology, and biomechanical principles to the design, development, and evaluation of biological and health systems and products, such as artificial organs, prostheses, instrumentation, medical information systems, and health management and care delivery systems.

**17-2041 Chemical Engineers**

Design chemical plant equipment and devise processes for manufacturing chemicals and products, such as gasoline, synthetic rubber, plastics, detergents, cement, paper, and pulp, by applying principles and technology of chemistry, physics, and engineering.

**17-2051 Civil Engineers**

Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, and water and sewage systems. Includes architectural, structural, traffic, ocean, and geo-technical engineers. Excludes "Hydrologists" (19-2043).

**17-2061 Computer Hardware Engineers**

Research, design, develop, or test computer or computer-related equipment for commercial, industrial, military, or scientific use. May supervise the manufacturing and installation of computer or computer-related equipment and components. Excludes "Software Developers, Applications" (15-1132) and "Software Developers, Systems Software (15-1133).

**17-2071 Electrical Engineers**

Research, design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use. Excludes "Computer Hardware Engineers" (17-2061).

**17-2072 Electronics Engineers, Except Computer**

Research, design, develop, or test electronic components and systems for commercial, industrial, military, or scientific use employing knowledge of electronic theory and materials properties. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls. Excludes "Computer Hardware Engineers" (17-2061).

**17-2081 Environmental Engineers**

Research, design, plan, or perform engineering duties in the prevention, control, and remediation of environmental hazards using various engineering disciplines. Work may include waste treatment, site remediation, or pollution control technology.

**17-2111 Health and Safety Engineers, Except Mining Safety Engineers and Inspectors**

Promote worksite or product safety by applying knowledge of industrial processes, mechanics, chemistry, psychology, and industrial health and safety laws. Includes industrial product safety engineers.

#### 17-2112 Industrial Engineers

Design, develop, test, and evaluate integrated systems for managing industrial production processes, including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination. Excludes "Health and Safety Engineers, Except Mining Safety Engineers and Inspectors" (17-2111).

#### 17-2121 Marine Engineers and Naval Architects

Design, develop, and evaluate the operation of marine vessels, ship machinery, and related equipment, such as power supply and propulsion systems.

#### 17-2131 Materials Engineers

Evaluate materials and develop machinery and processes to manufacture materials for use in products that must meet specialized design and performance specifications. Develop new uses for known materials. Includes those engineers working with composite materials or specializing in one type of material, such as graphite, metal and metal alloys, ceramics and glass, plastics and polymers, and naturally occurring materials. Includes metallurgists and metallurgical engineers, ceramic engineers, and welding engineers.

#### 17-2141 Mechanical Engineers

Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of equipment such as centralized heat, gas, water, and steam systems.

#### 17-2151 Mining and Geological Engineers, Including Mining Safety Engineers

Conduct sub-surface surveys to identify the characteristics of potential land or mining development sites. May specify the ground support systems, processes and equipment for safe, economical, and environmentally sound extraction or underground construction activities. May inspect areas for unsafe geological conditions, equipment, and working conditions. May design, implement, and coordinate mine safety programs. Excludes "Petroleum Engineers" (17-2171).

#### 17-2161 Nuclear Engineers

Conduct research on nuclear engineering projects or apply principles and theory of nuclear science to problems concerned with release, control, and use of nuclear energy and nuclear waste disposal.

#### 17-2171 Petroleum Engineers

Devise methods to improve oil and gas extraction and production and determine the need for new or modified tool designs. Oversee drilling and offer technical advice.

#### 17-2199 Engineers, All Other

All engineers not listed separately.

#### 17-3011 Architectural and Civil Drafters

Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Use knowledge of building materials, engineering practices, and mathematics to complete drawings.

#### 17-3012 Electrical and Electronics Drafters

Prepare wiring diagrams, circuit board assembly diagrams, and layout drawings used for the manufacture, installation, or repair of electrical equipment.

#### 17-3013 Mechanical Drafters

Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.

#### 17-3019 Drafters, All Other

All drafters not listed separately.

#### 17-3021 Aerospace Engineering and Operations Technicians

Operate, install, calibrate, and maintain integrated computer/communications systems, consoles, simulators, and other data acquisition, test, and measurement instruments and equipment, which are used to launch, track, position, and evaluate air and space vehicles. May record and interpret test data.

#### 17-3022 Civil Engineering Technicians

Apply theory and principles of civil engineering in planning, designing, and overseeing construction and maintenance of structures and facilities under the direction of engineering staff or physical scientists.

#### 17-3023 Electrical and Electronic Engineering Technicians

Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. Excludes "Broadcast Technicians" (27-4012).

#### 17-3024 Electro-Mechanical Technicians

Operate, test, maintain, or calibrate unmanned, automated, servo-mechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment at worksites, such as oil rigs, deep ocean exploration, or hazardous waste removal. May assist engineers in testing and designing robotics equipment.



**17-3025 Environmental Engineering Technicians**

Apply theory and principles of environmental engineering to modify, test, and operate equipment and devices used in the prevention, control, and remediation of environmental problems, including waste treatment and site remediation, under the direction of engineering staff or scientist. May assist in the development of environmental remediation devices.

**17-3026 Industrial Engineering Technicians**

Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May perform time and motion studies on worker operations in a variety of industries for purposes such as establishing standard production rates or improving efficiency.

**17-3027 Mechanical Engineering Technicians**

Apply theory and principles of mechanical engineering to modify, develop, test, or calibrate machinery and equipment under direction of engineering staff or physical scientists.

**17-3029 Engineering Technicians, Except Drafters, All Other**

All engineering technicians, except drafters, not listed separately.

**17-3031 Surveying and Mapping Technicians**

Perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. Excludes "Surveyors" (17-1022), "Cartographers and Photogrammetrists" (17-1021), and "Geoscientists, Except Hydrologists and Geographers" (19-2042).

**19-1011 Animal Scientists**

Conduct research in the genetics, nutrition, reproduction, growth, and development of domestic farm animals.

**19-1012 Food Scientists and Technologists**

Use chemistry, microbiology, engineering, and other sciences to study the principles underlying the processing and deterioration of foods; analyze food content to determine levels of vitamins, fat, sugar, and protein; discover new food sources; research ways to make processed foods safe, palatable, and healthful; and apply food science knowledge to determine best ways to process, package, preserve, store, and distribute food.

**19-1013 Soil and Plant Scientists**

Conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity.

**19-1021 Biochemists and Biophysicists**

Study the chemical composition or physical principles of living cells and organisms, their electrical and mechanical energy, and related phenomena. May conduct research to further understanding of the complex chemical combinations and reactions involved in metabolism, reproduction, growth, and heredity. May determine the effects of foods, drugs, serums, hormones, and other substances on tissues and vital processes of living organisms.

**19-1022 Microbiologists**

Investigate the growth, structure, development, and other characteristics of microscopic organisms, such as bacteria, algae, or fungi. Includes medical microbiologists who study the relationship between organisms and disease or the effects of antibiotics on microorganisms.

**19-1023 Zoologists and Wildlife Biologists**

Study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats.

**19-1029 Biological Scientists, All Other**

All biological scientists not listed separately.

**19-1031 Conservation Scientists**

Manage, improve, and protect natural resources to maximize their use without damaging the environment. May conduct soil surveys and develop plans to eliminate soil erosion or to protect rangelands. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. Excludes "Zoologists and Wildlife Biologists" (19-1023) and "Foresters" (19-1032).

**19-1032 Foresters**

Manage public and private forested lands for economic, recreational, and conservation purposes. May inventory the type, amount, and location of standing timber, appraise the timber's worth, negotiate the purchase, and draw up contracts for procurement. May determine how to conserve wildlife habitats, creek beds, water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and

growing new trees, monitor trees for healthy growth, and determine optimal harvesting schedules.

#### 19-1041 Epidemiologists

Investigate and describe the determinants and distribution of disease, disability, or health outcomes. May develop the means for prevention and control.

#### 19-1042 Medical Scientists, Except Epidemiologists

Conduct research dealing with the understanding of human diseases and the improvement of human health. Engage in clinical investigation, research and development, or other related activities. Includes physicians, dentists, public health specialists, pharmacologists, and medical pathologists who primarily conduct research. Practitioners who primarily provide medical or dental care or dispense drugs are included in "Health Diagnosing and Treating Practitioners" (29-1000).

#### 19-1099 Life Scientists, All Other

All life scientists not listed separately.

#### 19-2011 Astronomers

Observe, research, and interpret astronomical phenomena to increase basic knowledge or apply such information to practical problems.

#### 19-2012 Physicists

Conduct research into physical phenomena, develop theories on the basis of observation and experiments, and devise methods to apply physical laws and theories. Excludes "Biochemists and Biophysicists" (19-1021).

#### 19-2021 Atmospheric and Space Scientists

Investigate atmospheric phenomena and interpret meteorological data, gathered by surface and air stations, satellites, and radar to prepare reports and forecasts for public and other uses. Includes weather analysts and forecasters whose functions require the detailed knowledge of meteorology.

#### 19-2031 Chemists

Conduct qualitative and quantitative chemical analyses or experiments in laboratories for quality or process control or to develop new products or knowledge. Excludes "Geoscientists, Except Hydrologists and Geographers" (19-2042) and "Biochemists and Biophysicists" (19-1021).

#### 19-2032 Materials Scientists

Research and study the structures and chemical properties of various natural and synthetic or composite materials, including metals, alloys, rubber, ceramics, semiconductors, polymers, and glass. Determine ways to strengthen or combine materials or develop new materials with

new or specific properties for use in a variety of products and applications. Includes glass scientists, ceramic scientists, metallurgical scientists, and polymer scientists.

#### 19-2041 Environmental Scientists and Specialists, Including Health

Conduct research or perform investigation for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that affect either the environment or the health of the population. Using knowledge of various scientific disciplines, may collect, synthesize, study, report, and recommend action based on data derived from measurements or observations of air, food, soil, water, and other sources. Excludes "Zoologists and Wildlife Biologists" (19-1023), "Conservation Scientists" (19-1031), "Forest and Conservation Technicians" (19-4093), "Fish and Game Wardens" (33-3031), and "Forest and Conservation Workers" (45-4011).

#### 19-2042 Geoscientists, Except Hydrologists and Geographers

Study the composition, structure, and other physical aspects of the Earth. May use geological, physics, and mathematics knowledge in exploration for oil, gas, minerals, or underground water; or in waste disposal, land reclamation, or other environmental problems. May study the Earth's internal composition, atmospheres, oceans, and its magnetic, electrical, and gravitational forces. Includes mineralogists, crystallographers, paleontologists, stratigraphers, geodesists, and seismologists.

#### 19-2043 Hydrologists

Research the distribution, circulation, and physical properties of underground and surface waters; and study the form and intensity of precipitation, its rate of infiltration into the soil, movement through the earth, and its return to the ocean and atmosphere.

#### 19-2099 Physical Scientists, All Other

All physical scientists not listed separately.

#### 19-3011 Economists

Conduct research, prepare reports, or formulate plans to address economic problems related to the production and distribution of goods and services or monetary and fiscal policy. May collect and process economic and statistical data using sampling techniques and econometric methods. Excludes "Market Research Analysts and Marketing Specialists" (13-1161).

#### 19-3022 Survey Researchers

Plan, develop, or conduct surveys. May analyze and interpret the meaning of survey data, determine survey objectives, or suggest or test question wording. Includes social scientists who primarily design questionnaires or supervise survey teams. Excludes "Market Research Analysts and Marketing Specialists" (13-1161) and "Statisticians" (15-2041).

#### 19-3031 Clinical, Counseling, and School Psychologists

Diagnose and treat mental disorders; learning disabilities; and cognitive, behavioral, and emotional problems, using individual, child, family, and group therapies. May design and implement behavior modification programs.

#### 19-3032 Industrial-Organizational Psychologists

Apply principles of psychology to human resources, administration, management, sales, and marketing problems. Activities may include policy planning; employee testing and selection, training and development; and organizational development and analysis. May work with management to organize the work setting to improve worker productivity.

#### 19-3039 Psychologists, All Other

All psychologists not listed separately.

#### 19-3041 Sociologists

Study human society and social behavior by examining the groups and social institutions that people form, as well as various social, religious, political, and business organizations. May study the behavior and interaction of groups, trace their origin and growth, and analyze the influence of group activities on individual members.

#### 19-3051 Urban and Regional Planners

Develop comprehensive plans and programs for use of land and physical facilities of jurisdictions, such as towns, cities, counties, and metropolitan areas.

#### 19-3091 Anthropologists and Archeologists

Study the origin, development, and behavior of human beings. May study the way of life, language, or physical characteristics of people in various parts of the world. May engage in systematic recovery and examination of material evidence, such as tools or pottery remaining from past human cultures, in order to determine the history, customs, and living habits of earlier civilizations.

#### 19-3092 Geographers

Study the nature and use of areas of the Earth's surface, relating and interpreting interactions of physical and cultural phenomena. Conduct research on physical aspects of a region, including land forms, climates, soils, plants, and animals, and conduct research on the spatial implications of human activities within a given area, including social characteristics, economic activities, and political organization, as well as researching interdependence between regions at scales ranging from local to global.

#### 19-3093 Historians

Research, analyze, record, and interpret the past as recorded in sources, such as government and institutional records, newspapers and other periodicals, photographs, interviews, films, electronic media, and unpublished manuscripts, such as personal diaries and letters.

#### 19-3094 Political Scientists

Study the origin, development, and operation of political systems. May study topics, such as public opinion, political decision-making, and ideology. May analyze the structure and operation of governments, as well as various political entities. May conduct public opinion surveys, analyze election results, or analyze public documents. Excludes "Survey Researchers" (19-3022).

#### 19-3099 Social Scientists and Related Workers, All Other

All social scientists and related workers not listed separately.

#### 19-4011 Agricultural and Food Science Technicians

Work with agricultural and food scientists in food, fiber, and animal research, production, and processing; and assist with animal breeding and nutrition. Conduct tests and experiments to improve yield and quality of crops or to increase the resistance of plants and animals to disease or insects. Includes technicians who assist food scientists or technologists in the research and development of production technology, quality control, packaging, processing, and use of foods.

#### 19-4021 Biological Technicians

Assist biological and medical scientists in laboratories. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.

#### 19-4031 Chemical Technicians

Conduct chemical and physical laboratory tests to assist scientists in making qualitative and quantitative analyses of solids, liquids, and gaseous materials for research and development of new products or processes, quality control, maintenance of environmental standards, and other work involving experimental, theoretical, or practical application of chemistry and related sciences.

#### 19-4041 Geological and Petroleum Technicians

Assist scientists or engineers in the use of electronic, sonic, or nuclear measuring instruments in both laboratory and production activities to obtain data indicating potential resources such as metallic ore, minerals, gas, coal, or petroleum. Analyze mud and drill cuttings. Chart pressure, temperature, and other characteristics of wells or bore holes. Investigate and collect information leading to the possible discovery of new metallic ore, minerals, gas, coal, or petroleum deposits.

**19-4051 Nuclear Technicians**

Assist nuclear physicists, nuclear engineers, or other scientists in laboratory or production activities. May operate, maintain, or provide quality control for nuclear testing and research equipment. May monitor radiation.

**19-4061 Social Science Research Assistants**

Assist social scientists in laboratory, survey, and other social science research. May help prepare findings for publication and assist in laboratory analysis, quality control, or data management. Excludes "Graduate Teaching Assistants" (25-1191).

**19-4091 Environmental Science and Protection Technicians, Including Health**

Perform laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health, under the direction of an environmental scientist, engineer, or other specialist. May collect samples of gases, soil, water, and other materials for testing.

**19-4092 Forensic Science Technicians**

Collect, identify, classify, and analyze physical evidence related to criminal investigations. Perform tests on weapons or substances, such as fiber, hair, and tissue to determine significance to investigation. May testify as expert witnesses on evidence or crime laboratory techniques. May serve as specialists in area of expertise, such as ballistics, fingerprinting, handwriting, or biochemistry.

**19-4093 Forest and Conservation Technicians**

Provide technical assistance regarding the conservation of soil, water, forests, or related natural resources. May compile data pertaining to size, content, condition, and other characteristics of forest tracts, under the direction of foresters; or train and lead forest workers in forest propagation, fire prevention and suppression. May assist conservation scientists in managing, improving, and protecting rangelands and wildlife habitats. Excludes "Conservation Scientists" (19-1031) and "Foresters" (19-1032).

**19-4099 Life, Physical, and Social Science Technicians, All Other**

All life, physical, and social science technicians not listed separately.

**21-1011 Substance Abuse and Behavioral Disorder Counselors**

Counsel and advise individuals with alcohol, tobacco, drug, or other problems, such as gambling and eating disorders. May counsel individuals, families, or groups or engage in prevention programs. Excludes "Social Workers" (21-1021 through 21-1029), "Psychologists" (19-3031 through 19-3039), and "Mental Health Counselors" (21-1014) providing these services.

#### 21-1012 Educational, Guidance, School, and Vocational Counselors

Counsel individuals and provide group educational and vocational guidance services.

#### 21-1013 Marriage and Family Therapists

Diagnose and treat mental and emotional disorders, whether cognitive, affective, or behavioral, within the context of marriage and family systems. Apply psychotherapeutic and family systems theories and techniques in the delivery of services to individuals, couples, and families for the purpose of treating such diagnosed nervous and mental disorders. Excludes "Social Workers" (21-1021 through 21-1029) and "Psychologists" of all types (19-3031 through 19-3039).

#### 21-1014 Mental Health Counselors

Counsel with emphasis on prevention. Work with individuals and groups to promote optimum mental and emotional health. May help individuals deal with issues associated with addictions and substance abuse; family, parenting, and marital problems; stress management; self-esteem; and aging. Excludes "Social Workers" (21-1021 through 21-1029), "Psychiatrists" (29-1066), and "Psychologists" (19-3031 through 19-3039).

#### 21-1015 Rehabilitation Counselors

Counsel individuals to maximize the independence and employability of persons coping with personal, social, and vocational difficulties that result from birth defects, illness, disease, accidents, or the stress of daily life. Coordinate activities for residents of care and treatment facilities. Assess client needs and design and implement rehabilitation programs that may include personal and vocational counseling, training, and job placement.

#### 21-1019 Counselors, All Other

All counselors not listed separately.

#### 21-1021 Child, Family, and School Social Workers

Provide social services and assistance to improve the social and psychological functioning of children and their families and to maximize the family well-being and the academic functioning of children. May assist parents, arrange adoptions, and find foster homes for abandoned or abused children. In schools, they address such problems as teenage pregnancy, misbehavior, and truancy. May also advise teachers.

#### 21-1022 Healthcare Social Workers

Provide individuals, families, and groups with the psychosocial support needed to cope with chronic, acute, or terminal illnesses. Services include advising family care givers, providing patient education and counseling, and making referrals for other services. May also provide care and case management or interventions designed to promote health, prevent disease, and address barriers to access to healthcare.



**21-1023 Mental Health and Substance Abuse Social Workers**

Assess and treat individuals with mental, emotional, or substance abuse problems, including abuse of alcohol, tobacco, and/or other drugs. Activities may include individual and group therapy, crisis intervention, case management, client advocacy, prevention, and education.

**21-1029 Social Workers, All Other**

All social workers not listed separately.

**21-1091 Health Educators**

Provide and manage health education programs that help individuals, families, and their communities maximize and maintain healthy lifestyles. Collect and analyze data to identify community needs prior to planning, implementing, monitoring, and evaluating programs designed to encourage healthy lifestyles, policies, and environments. May serve as resource to assist individuals, other health professionals, or the community, and may administer fiscal resources for health education programs. Excludes "Community Health Workers" (21-1094).

**21-1092 Probation Officers and Correctional Treatment Specialists**

Provide social services to assist in rehabilitation of law offenders in custody or on probation or parole. Make recommendations for actions involving formulation of rehabilitation plan and treatment of offender, including conditional release and education and employment stipulations.

**21-1093 Social and Human Service Assistants**

Assist in providing client services in a wide variety of fields, such as psychology, rehabilitation, or social work, including support for families. May assist clients in identifying and obtaining available benefits and social and community services. May assist social workers with developing, organizing, and conducting programs to prevent and resolve problems relevant to substance abuse, human relationships, rehabilitation, or dependent care. Excludes "Rehabilitation Counselors" (21-1015), "Psychiatric Technicians" (29-2053), "Personal Care Aides" (39-9021), and "Eligibility Interviewers, Government Programs" (43-4061).

**21-1094 Community Health Workers**

Assist individuals and communities to adopt healthy behaviors. Conduct outreach for medical personnel or health organizations to implement programs in the community that promote, maintain, and improve individual and community health. May provide information on available resources, provide social support and informal counseling, advocate for individuals and community health needs, and provide services such as first aid and blood pressure screening. May collect data to help identify community health needs. Excludes "Health Educators" (21-1091).

**21-1099 Community and Social Service Specialists, All Other**

All community and social service specialists not listed separately.

#### 21-2011 Clergy

Conduct religious worship and perform other spiritual functions associated with beliefs and practices of religious faith or denomination. Provide spiritual and moral guidance and assistance to members.

#### 21-2021 Directors, Religious Activities and Education

Plan, direct, or coordinate programs designed to promote the religious education or activities of a denominational group. May provide counseling and guidance relative to marital, health, financial, and religious problems.

#### 21-2099 Religious Workers, All Other

All religious workers not listed separately.

#### 23-1011 Lawyers

Represent clients in criminal and civil litigation and other legal proceedings, draw up legal documents, or manage or advise clients on legal transactions. May specialize in a single area or may practice broadly in many areas of law.

#### 23-1012 Judicial Law Clerks

Assist judges in court or by conducting research or preparing legal documents. Excludes "Lawyers" (23-1011) and "Paralegals and Legal Assistants" (23-2011).

#### 23-1021 Administrative Law Judges, Adjudicators, and Hearing Officers

Conduct hearings to recommend or make decisions on claims concerning government programs or other government-related matters. Determine liability, sanctions, or penalties, or recommend the acceptance or rejection of claims or settlements. Excludes "Arbitrators, Mediators, and Conciliators" (23-1022).

#### 23-1022 Arbitrators, Mediators, and Conciliators

Facilitate negotiation and conflict resolution through dialogue. Resolve conflicts outside of the court system by mutual consent of parties involved.

#### 23-1023 Judges, Magistrate Judges, and Magistrates

Arbitrate, advise, adjudicate, or administer justice in a court of law. May sentence defendant in criminal cases according to government statutes or sentencing guidelines. May determine liability of defendant in civil cases. May perform wedding ceremonies.

#### 23-2011 Paralegals and Legal Assistants

Assist lawyers by investigating facts, preparing legal documents, or researching legal precedent. Conduct research to support a legal proceeding, to formulate a defense, or to initiate legal action. Excludes "Legal Secretaries" (43-6012).

### 23-2091 Court Reporters

Use verbatim methods and equipment to capture, store, retrieve, and transcribe pretrial and trial proceedings or other information. Includes stenocaptioners who operate computerized stenographic captioning equipment to provide captions of live or prerecorded broadcasts for hearing-impaired viewers.

### 23-2093 Title Examiners, Abstractors, and Searchers

Search real estate records, examine titles, or summarize pertinent legal or insurance documents or details for a variety of purposes. May compile lists of mortgages, contracts, and other instruments pertaining to titles by searching public and private records for law firms, real estate agencies, or title insurance companies.

### 23-2099 Legal Support Workers, All Other

All legal support workers not listed separately.

### 25-1011 Business Teachers, Postsecondary

Teach courses in business administration and management, such as accounting, finance, human resources, labor and industrial relations, marketing, and operations research. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

### 25-1021 Computer Science Teachers, Postsecondary

Teach courses in computer science. May specialize in a field of computer science, such as the design and function of computers or operations and research analysis. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

### 25-1022 Mathematical Science Teachers, Postsecondary

Teach courses pertaining to mathematical concepts, statistics, and actuarial science and to the application of original and standardized mathematical techniques in solving specific problems and situations. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

### 25-1031 Architecture Teachers, Postsecondary

Teach courses in architecture and architectural design, such as architectural environmental design, interior architecture/design, and landscape architecture. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

### 25-1032 Engineering Teachers, Postsecondary

Teach courses pertaining to the application of physical laws and principles of engineering for the development of machines, materials, instruments, processes, and services. Includes teachers of subjects such as chemical, civil, electrical, industrial, mechanical, mineral, and petroleum engineering. Includes both teachers primarily engaged in teaching and those who

do a combination of teaching and research. Excludes "Computer Science Teachers, Postsecondary" (25-1021).

#### 25-1041 Agricultural Sciences Teachers, Postsecondary

Teach courses in the agricultural sciences. Includes teachers of agronomy, dairy sciences, fisheries management, horticultural sciences, poultry sciences, range management, and agricultural soil conservation. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research. Excludes "Forestry and Conservation Science Teachers, Postsecondary" (25-1043).

#### 25-1042 Biological Science Teachers, Postsecondary

Teach courses in biological sciences. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

#### 25-1043 Forestry and Conservation Science Teachers, Postsecondary

Teach courses in forestry and conservation science. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research. Excludes "Agricultural Science Teachers, Postsecondary" (25-1041) and "Environmental Science Teachers, Postsecondary" (25-1053).

#### 25-1051 Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary

Teach courses in the physical sciences, except chemistry and physics. Includes both teachers primarily engaged in teaching, and those who do a combination of teaching and research.

#### 25-1052 Chemistry Teachers, Postsecondary

Teach courses pertaining to the chemical and physical properties and compositional changes of substances. Work may include instruction in the methods of qualitative and quantitative chemical analysis. Includes both teachers primarily engaged in teaching, and those who do a combination of teaching and research. Excludes "Biological Science Teachers, Postsecondary" (25-1042) who teach biochemistry.

#### 25-1053 Environmental Science Teachers, Postsecondary

Teach courses in environmental science. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

#### 25-1054 Physics Teachers, Postsecondary

Teach courses pertaining to the laws of matter and energy. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

#### 25-1061 Anthropology and Archeology Teachers, Postsecondary

Teach courses in anthropology or archeology. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1062 Area, Ethnic, and Cultural Studies Teachers, Postsecondary**

Teach courses pertaining to the culture and development of an area, an ethnic group, or any other group, such as Latin American studies, women's studies, or urban affairs. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1063 Economics Teachers, Postsecondary**

Teach courses in economics. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1064 Geography Teachers, Postsecondary**

Teach courses in geography. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1065 Political Science Teachers, Postsecondary**

Teach courses in political science, international affairs, and international relations. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1066 Psychology Teachers, Postsecondary**

Teach courses in psychology, such as child, clinical, and developmental psychology, and psychological counseling. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1067 Sociology Teachers, Postsecondary**

Teach courses in sociology. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1069 Social Sciences Teachers, Postsecondary, All Other**

All postsecondary social sciences teachers not listed separately.

**25-1071 Health Specialties Teachers, Postsecondary**

Teach courses in health specialties, in fields such as dentistry, laboratory technology, medicine, pharmacy, public health, therapy, and veterinary medicine. Excludes "Nursing Instructors and Teachers, Postsecondary" (25-1072) and "Biological Science Teachers, Postsecondary" (25-1042) who teach medical science.

**25-1072 Nursing Instructors and Teachers, Postsecondary**

Demonstrate and teach patient care in classroom and clinical units to nursing students. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1081 Education Teachers, Postsecondary

Teach courses pertaining to education, such as counseling, curriculum, guidance, instruction, teacher education, and teaching English as a second language. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1082 Library Science Teachers, Postsecondary

Teach courses in library science. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1111 Criminal Justice and Law Enforcement Teachers, Postsecondary

Teach courses in criminal justice, corrections, and law enforcement administration. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1112 Law Teachers, Postsecondary

Teach courses in law. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1113 Social Work Teachers, Postsecondary

Teach courses in social work. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1121 Art, Drama, and Music Teachers, Postsecondary

Teach courses in drama, music, and the arts including fine and applied art, such as painting and sculpture, or design and crafts. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1122 Communications Teachers, Postsecondary

Teach courses in communications, such as organizational communications, public relations, radio/television broadcasting, and journalism. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1123 English Language and Literature Teachers, Postsecondary

Teach courses in English language and literature, including linguistics and comparative literature. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

25-1124 Foreign Language and Literature Teachers, Postsecondary

Teach languages and literature courses in languages other than English. Includes teachers of American Sign Language (ASL). Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1125 History Teachers, Postsecondary**

Teach courses in human history and historiography. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1126 Philosophy and Religion Teachers, Postsecondary**

Teach courses in philosophy, religion, and theology. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1191 Graduate Teaching Assistants**

Assist faculty or other instructional staff in postsecondary institutions by performing teaching or teaching-related duties, such as teaching lower level courses, developing teaching materials, preparing and giving examinations, and grading examinations or papers. Graduate teaching assistants must be enrolled in a graduate school program. Graduate assistants who primarily perform non-teaching duties, such as research, should be reported in the occupational category related to the work performed. Excludes "Teacher Assistants" (25-9041).

**25-1192 Home Economics Teachers, Postsecondary**

Teach courses in childcare, family relations, finance, nutrition, and related subjects pertaining to home management. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1193 Recreation and Fitness Studies Teachers, Postsecondary**

Teach courses pertaining to recreation, leisure, and fitness studies, including exercise physiology and facilities management. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

**25-1194 Vocational Education Teachers, Postsecondary**

Teach or instruct vocational or occupational subjects at the postsecondary level (but at less than the baccalaureate) to students who have graduated or left high school. Includes correspondence school instructors; industrial, commercial, and government training instructors; and adult education teachers and instructors who prepare persons to operate industrial machinery and equipment and transportation and communications equipment. Teaching may take place in public or private schools whose primary business is education or in a school associated with an organization whose primary business is other than education.

**25-1199 Postsecondary Teachers, All Other**

All postsecondary teachers not listed separately.

**25-2011 Preschool Teachers, Except Special Education**

Instruct preschool-aged children in activities designed to promote social, physical, and intellectual growth needed for primary school in preschool, day care center, or other child

development facility. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099). May be required to hold State certification. Excludes "Childcare Workers" (39-9011) and "Special Education Teachers" (25-2050).

#### 25-2012 Kindergarten Teachers, Except Special Education

Teach elemental natural and social science, personal hygiene, music, art, and literature to kindergarten students. Promote physical, mental, and social development. May be required to hold State certification. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099). Excludes "Special Education Teachers" (25-2050).

#### 25-2021 Elementary School Teachers, Except Special Education

Teach students basic academic, social, and other formative skills in public or private schools at the elementary level. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099). Excludes "Special Education Teachers" (25-2050).

#### 25-2022 Middle School Teachers, Except Special and Career/Technical Education

Teach students in one or more subjects in public or private schools at the middle, intermediate, or junior high level, which falls between elementary and senior high school as defined by applicable laws and regulations. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099). Excludes "Career/Technical Education Teachers, Middle School" (25-2023) and "Special Education Teachers" (25-2050).

#### 25-2023 Career/Technical Education Teachers, Middle School

Teach occupational, career and technical, or vocational subjects in public or private schools at the middle, intermediate, or junior high level, which falls between elementary and senior high school as defined by applicable laws and regulations. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099). Excludes "Special Education Teachers" (25-2050).

#### 25-2031 Secondary School Teachers, Except Special and Career/Technical Education

Teach students in one or more subjects, such as English, mathematics, or social studies at the secondary level in public or private schools. May be designated according to subject matter specialty. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099). Excludes "Career/Technical Education Teachers, Secondary School" (25-2032) and "Special Education Teachers" (25-2050).

#### 25-2032 Career/Technical Education Teachers, Secondary School

Teach occupational, career and technical, or vocational subjects at the secondary school level in public or private schools. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099). Excludes "Special Education Teachers, Secondary School" (25-2054).



25-2051 Special Education Teachers, Preschool

Teach preschool school subjects to educationally and physically handicapped students. Includes teachers who specialize and work with audibly and visually handicapped students and those who teach basic academic and life processes skills to the mentally impaired. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099).

25-2052 Special Education Teachers, Kindergarten and Elementary School

Teach elementary school subjects to educationally and physically handicapped students. Includes teachers who specialize and work with audibly and visually handicapped students and those who teach basic academic and life processes skills to the mentally impaired. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099).

25-2053 Special Education Teachers, Middle School

Teach middle school subjects to educationally and physically handicapped students. Includes teachers who specialize and work with audibly and visually handicapped students and those who teach basic academic and life processes skills to the mentally impaired. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099).

25-2054 Special Education Teachers, Secondary School

Teach secondary school subjects to educationally and physically handicapped students. Includes teachers who specialize and work with audibly and visually handicapped students and those who teach basic academic and life processes skills to the mentally impaired. Substitute teachers are included in "Teachers and Instructors, All Other" (25-3099).

25-2059 Special Education Teachers, All Other

All special education teachers not listed separately.

25-3011 Adult Basic and Secondary Education and Literacy Teachers and Instructors

Teach or instruct out-of-school youths and adults in remedial education classes, preparatory classes for the General Educational Development test, literacy, or English as a Second Language. Teaching may or may not take place in a traditional educational institution.

25-3021 Self-Enrichment Education Teachers

Teach or instruct courses other than those that normally lead to an occupational objective or degree. Courses may include self-improvement, nonvocational, and nonacademic subjects. Teaching may or may not take place in a traditional educational institution. Excludes "Fitness Trainers and Aerobics Instructors" (39-9031). Flight instructors are included with "Aircraft Pilots and Flight Engineers" (53-2010).

25-3099 Teachers and Instructors, All Other

All teachers and instructors not listed separately.

#### 25-4011 Archivists

Appraise, edit, and direct safekeeping of permanent records and historically valuable documents. Participate in research activities based on archival materials.

#### 25-4012 Curators

Administer collections, such as artwork, collectibles, historic items, or scientific specimens of museums or other institutions. May conduct instructional, research, or public service activities of institution.

#### 25-4013 Museum Technicians and Conservators

Restore, maintain, or prepare objects in museum collections for storage, research, or exhibit. May work with specimens such as fossils, skeletal parts, or botanicals; or artifacts, textiles, or art. May identify and record objects or install and arrange them in exhibits. Includes book or document conservators.

#### 25-4021 Librarians

Administer libraries and perform related library services. Work in a variety of settings, including public libraries, educational institutions, museums, corporations, government agencies, law firms, non-profit organizations, and healthcare providers. Tasks may include selecting, acquiring, cataloguing, classifying, circulating, and maintaining library materials; and furnishing reference, bibliographical, and readers' advisory services. May perform in-depth, strategic research, and synthesize, analyze, edit, and filter information. May set up or work with databases and information systems to catalogue and access information.

#### 25-4031 Library Technicians

Assist librarians by helping readers in the use of library catalogs, databases, and indexes to locate books and other materials; and by answering questions that require only brief consultation of standard reference. Compile records; sort and shelve books or other media; remove or repair damaged books or other media; register patrons; and check materials in and out of the circulation process. Replace materials in shelving area (stacks) or files. Includes bookmobile drivers who assist with providing services in mobile libraries.

#### 25-9011 Audio-Visual and Multimedia Collections Specialists

Prepare, plan, and operate multimedia teaching aids for use in education. May record, catalogue, and file materials.

#### 25-9021 Farm and Home Management Advisors

Advise, instruct, and assist individuals and families engaged in agriculture, agricultural-related processes, or home economics activities. Demonstrate procedures and apply research findings to solve problems; and instruct and train in product development, sales, and the use of machinery and equipment to promote general welfare. Includes county agricultural agents, feed and farm management advisers, home economists, and extension service advisors.

#### 25-9031 Instructional Coordinators

Develop instructional material, coordinate educational content, and incorporate current technology in specialized fields that provide guidelines to educators and instructors for developing curricula and conducting courses. Includes educational consultants and specialists, and instructional material directors.

#### 25-9041 Teacher Assistants

Perform duties that are instructional in nature or deliver direct services to students or parents. Serve in a position for which a teacher has ultimate responsibility for the design and implementation of educational programs and services. Excludes "Graduate Teaching Assistants" (25-1191).

#### 25-9099 Education, Training, and Library Workers, All Other

All education, training, and library workers not listed separately.

#### 27-1011 Art Directors

Formulate design concepts and presentation approaches for visual communications media, such as print, broadcasting, and advertising. Direct workers engaged in art work or layout design.

#### 27-1012 Craft Artists

Create or reproduce hand-made objects for sale and exhibition using a variety of techniques, such as welding, weaving, pottery, and needlecraft.

#### 27-1013 Fine Artists, Including Painters, Sculptors, and Illustrators

Create original artwork using any of a wide variety of media and techniques.

#### 27-1014 Multimedia Artists and Animators

Create special effects, animation, or other visual images using film, video, computers, or other electronic tools and media for use in products or creations, such as computer games, movies, music videos, and commercials.

#### 27-1019 Artists and Related Workers, All Other

All artists and related workers not listed separately.

#### 27-1021 Commercial and Industrial Designers

Develop and design manufactured products, such as cars, home appliances, and children's toys. Combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design.

#### 27-1022 Fashion Designers

Design clothing and accessories. Create original designs or adapt fashion trends.

#### 27-1023 Floral Designers

Design, cut, and arrange live, dried, or artificial flowers and foliage.

#### 27-1024 Graphic Designers

Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

#### 27-1025 Interior Designers

Plan, design, and furnish interiors of residential, commercial, or industrial buildings. Formulate design which is practical, aesthetic, and conducive to intended purposes, such as raising productivity, selling merchandise, or improving life style. May specialize in a particular field, style, or phase of interior design. Excludes "Merchandise Displayers and Window Trimmers" (27-1026).

#### 27-1026 Merchandise Displayers and Window Trimmers

Plan and erect commercial displays, such as those in windows and interiors of retail stores and at trade exhibitions.

#### 27-1027 Set and Exhibit Designers

Design special exhibits and movie, television, and theater sets. May study scripts, confer with directors, and conduct research to determine appropriate architectural styles.

#### 27-1029 Designers, All Other

All designers not listed separately.

#### 27-2011 Actors

Play parts in stage, television, radio, video, motion picture productions, or other settings for entertainment, information, or instruction. Interpret serious or comic role by speech, gesture, and body movement to entertain or inform audience. May dance and sing.

#### 27-2012 Producers and Directors

Produce or direct stage, television, radio, video, or motion picture productions for entertainment, information, or instruction. Responsible for creative decisions, such as interpretation of script, choice of actors or guests, set design, sound, special effects, and choreography.

#### 27-2021 Athletes and Sports Competitors

Compete in athletic events.

#### 27-2022 Coaches and Scouts

Instruct or coach groups or individuals in the fundamentals of sports. Demonstrate techniques and methods of participation. May evaluate athletes' strengths and weaknesses as possible recruits or to improve the athletes' technique to prepare them for competition. Those required to hold teaching degrees should be reported in the appropriate teaching category. Excludes "Athletic Trainers" (29-9091).

#### 27-2023 Umpires, Referees, and Other Sports Officials

Officiate at competitive athletic or sporting events. Detect infractions of rules and decide penalties according to established regulations. Includes all sporting officials, referees, and competition judges.

#### 27-2031 Dancers

Perform dances. May perform on stage, for on-air broadcasting, or for video recording

#### 27-2032 Choreographers

Create new dance routines. Rehearse performance of routines. May direct and stage presentations.

#### 27-2041 Music Directors and Composers

Conduct, direct, plan, and lead instrumental or vocal performances by musical groups, such as orchestras, bands, choirs, and glee clubs. Includes arrangers, composers, choral directors, and orchestrators.

#### 27-2042 Musicians and Singers

Play one or more musical instruments or sing. May perform on stage, for on-air broadcasting, or for sound or video recording.

#### 27-2099 Entertainers and Performers, Sports and Related Workers, All Other

All entertainers and performers, sports and related workers not listed separately.

#### 27-3011 Radio and Television Announcers

Speak or read from scripted materials, such as news reports or commercial messages, on radio or television. May announce artist or title of performance, identify station, or interview guests. Excludes "Broadcast News Analysts" (27-3021).

**27-3012 Public Address System and Other Announcers**

Make announcements over public address system at sporting or other public events. May act as master of ceremonies or disc jockey at weddings, parties, clubs, or other gathering places.

**27-3021 Broadcast News Analysts**

Analyze, interpret, and broadcast news received from various sources.

**27-3022 Reporters and Correspondents**

Collect and analyze facts about newsworthy events by interview, investigation, or observation. Report and write stories for newspaper, news magazine, radio, or television. Excludes "Broadcast News Analysts" (27-3021).

**27-3031 Public Relations Specialists**

Engage in promoting or creating an intended public image for individuals, groups, or organizations. May write or select material for release to various communications media.

**27-3041 Editors**

Plan, coordinate, or edit content of material for publication. May review proposals and drafts for possible publication. Includes technical editors.

**27-3042 Technical Writers**

Write technical materials, such as equipment manuals, appendices, or operating and maintenance instructions. May assist in layout work.

**27-3043 Writers and Authors**

Originate and prepare written material, such as scripts, stories, advertisements, and other material. Excludes "Public Relations Specialists" (27-3031) and "Technical Writers" (27-3042).

**27-3091 Interpreters and Translators**

Interpret oral or sign language, or translate written text from one language into another.

**27-3099 Media and Communication Workers, All Other**

All media and communication workers not listed separately.

**27-4011 Audio and Video Equipment Technicians**

Set up, or set up and operate audio and video equipment including microphones, sound speakers, video screens, projectors, video monitors, recording equipment, connecting wires and cables, sound and mixing boards, and related electronic equipment for concerts, sports events, meetings and conventions, presentations, and news conferences. May also set up and operate associated spotlights and other custom lighting systems. Excludes "Sound Engineering Technicians" (27-4014).

**27-4012 Broadcast Technicians**

Set up, operate, and maintain the electronic equipment used to transmit radio and television programs. Control audio equipment to regulate volume level and quality of sound during radio and television broadcasts. Operate transmitter to broadcast radio or television programs.

**27-4013 Radio Operators**

Receive and transmit communications using radiotelephone equipment in accordance with government regulations. May repair equipment. Excludes "Radio, Cellular, and Tower Equipment Installers and Repairers" (49-2021).

**27-4014 Sound Engineering Technicians**

Operate machines and equipment to record, synchronize, mix, or reproduce music, voices, or sound effects in sporting arenas, theater productions, recording studios, or movie and video productions.

**27-4021 Photographers**

Photograph people, landscapes, merchandise, or other subjects, using digital or film cameras and equipment. May develop negatives or use computer software to produce finished images and prints. Includes scientific photographers, aerial photographers, and photojournalists.

**27-4031 Camera Operators, Television, Video, and Motion Picture**

Operate television, video, or motion picture camera to record images or scenes for various purposes, such as TV broadcasts, advertising, video production, or motion pictures.

**27-4032 Film and Video Editors**

Edit moving images on film, video, or other media. May edit or synchronize soundtracks with images. Excludes "Sound Engineering Technicians"(27-4014).

**27-4099 Media and Communication Equipment Workers, All Other**

All media and communication equipment workers not listed separately.

**29-1011 Chiropractors**

Assess, treat, and care for patients by manipulation of spine and musculoskeletal system. May provide spinal adjustment or address sacral or pelvic misalignment.

**29-1021 Dentists, General**

Examine, diagnose, and treat diseases, injuries, and malformations of teeth and gums. May treat diseases of nerve, pulp, and other dental tissues affecting oral hygiene and retention of teeth. May fit dental appliances or provide preventive care. Excludes "Prosthodontists" (29-1024), "Orthodontists" (29-1023), "Oral and Maxillofacial Surgeons" (29-1022) and "Dentists, All Other Specialists" (29-1029).

#### 29-1022 Oral and Maxillofacial Surgeons

Perform surgery and related procedures on the hard and soft tissues of the oral and maxillofacial regions to treat diseases, injuries, or defects. May diagnose problems of the oral and maxillofacial regions. May perform surgery to improve function or appearance.

#### 29-1023 Orthodontists

Examine, diagnose, and treat dental malocclusions and oral cavity anomalies. Design and fabricate appliances to realign teeth and jaws to produce and maintain normal function and to improve appearance.

#### 29-1024 Prosthodontists

Construct oral prostheses to replace missing teeth and other oral structures to correct natural and acquired deformation of mouth and jaws, to restore and maintain oral function, such as chewing and speaking, and to improve appearance.

#### 29-1029 Dentists, All Other Specialists

All dentists not listed separately.

#### 29-1031 Dietitians and Nutritionists

Plan and conduct food service or nutritional programs to assist in the promotion of health and control of disease. May supervise activities of a department providing quantity food services, counsel individuals, or conduct nutritional research.

#### 29-1041 Optometrists

Diagnose, manage, and treat conditions and diseases of the human eye and visual system. Examine eyes and visual system, diagnose problems or impairments, prescribe corrective lenses, and provide treatment. May prescribe therapeutic drugs to treat specific eye conditions. Ophthalmologists are included in "Physicians and Surgeons, All Other" (29-1069).

#### 29-1051 Pharmacists

Dispense drugs prescribed by physicians and other health practitioners and provide information to patients about medications and their use. May advise physicians and other health practitioners on the selection, dosage, interactions, and side effects of medications.

#### 29-1061 Anesthesiologists

Physicians who administer anesthetics prior to, during, or after surgery, or other medical procedures.

#### 29-1062 Family and General Practitioners

Physicians who diagnose, treat, and help prevent diseases and injuries that commonly occur in the general population. May refer patients to specialists when needed for further diagnosis or treatment.



#### 29-1063 Internists, General

Physicians who diagnose and provide non-surgical treatment of diseases and injuries of internal organ systems. Provide care mainly for adults who have a wide range of problems associated with the internal organs. Subspecialists, such as cardiologists and gastroenterologists, are included in "Physicians and Surgeons, All Other" (29-1069).

#### 29-1064 Obstetricians and Gynecologists

Physicians who provide medical care related to pregnancy or childbirth and those who diagnose, treat, and help prevent diseases of women, particularly those affecting the reproductive system. May also provide general medical care to women.

#### 29-1065 Pediatricians, General

Physicians who diagnose, treat, and help prevent children's diseases and injuries.

#### 29-1066 Psychiatrists

Physicians who diagnose, treat, and help prevent disorders of the mind.

#### 29-1067 Surgeons

Physicians who treat diseases, injuries, and deformities by invasive, minimally-invasive, or non-invasive surgical methods, such as using instruments, appliances, or by manual manipulation. Excludes "Oral and Maxillofacial Surgeons" (29-1022).

#### 29-1069 Physicians and Surgeons, All Other

All physicians and surgeons not listed separately.

#### 29-1071 Physician Assistants

Provide healthcare services typically performed by a physician, under the supervision of a physician. Conduct complete physicals, provide treatment, and counsel patients. May, in some cases, prescribe medication. Must graduate from an accredited educational program for physician assistants. Excludes "Emergency Medical Technicians and Paramedics" (29-2041), "Medical Assistants" (31-9092), "Registered Nurses" (29-1141), "Nurse Anesthetists" (29-1151), "Nurse Midwives" (29-1161), and "Nurse Practitioners" (29-1171).

#### 29-1081 Podiatrists

Diagnose and treat diseases and deformities of the human foot.

#### 29-1122 Occupational Therapists

Assess, plan, organize, and participate in rehabilitative programs that help build or restore vocational, homemaking, and daily living skills, as well as general independence, to persons with disabilities or developmental delays.

#### 29-1123 Physical Therapists

Assess, plan, organize, and participate in rehabilitative programs that improve mobility, relieve pain, increase strength, and improve or correct disabling conditions resulting from disease or injury.

#### 29-1124 Radiation Therapists

Provide radiation therapy to patients as prescribed by a radiologist according to established practices and standards. Duties may include reviewing prescription and diagnosis; acting as liaison with physician and supportive care personnel; preparing equipment, such as immobilization, treatment, and protection devices; and maintaining records, reports, and files. May assist in dosimetry procedures and tumor localization.

#### 29-1125 Recreational Therapists

Plan, direct, or coordinate medically-approved recreation programs for patients in hospitals, nursing homes, or other institutions. Activities include sports, trips, dramatics, social activities, and arts and crafts. May assess a patient condition and recommend appropriate recreational activity. Excludes "Recreation Workers" (39-9032).

#### 29-1126 Respiratory Therapists

Assess, treat, and care for patients with breathing disorders. Assume primary responsibility for all respiratory care modalities, including the supervision of respiratory therapy technicians. Initiate and conduct therapeutic procedures; maintain patient records; and select, assemble, check, and operate equipment.

#### 29-1127 Speech-Language Pathologists

Assess and treat persons with speech, language, voice, and fluency disorders. May select alternative communication systems and teach their use. May perform research related to speech and language problems.

#### 29-1128 Exercise Physiologists

Assess, plan, or implement fitness programs that include exercise or physical activities such as those designed to improve cardiorespiratory function, body composition, muscular strength, muscular endurance, or flexibility. Excludes "Physical Therapists" (29-1123), "Athletic Trainers" (29-9091), and "Fitness Trainers and Aerobic Instructors" (39-9031).

#### 29-1129 Therapists, All Other

All therapists not listed separately.

#### 29-1131 Veterinarians

Diagnose, treat, or research diseases and injuries of animals. Includes veterinarians who conduct research and development, inspect livestock, or care for pets and companion animals.

**29-1141 Registered Nurses**

Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management. Licensing or registration required. Includes Clinical Nurse Specialists. Excludes "Nurse Anesthetists" (29-1151), "Nurse Midwives" (29-1161), and "Nurse Practitioners" (29-1171).

**29-1151 Nurse Anesthetists**

Administer anesthesia, monitor patient's vital signs, and oversee patient recovery from anesthesia. May assist anesthesiologists, surgeons, other physicians, or dentists. Must be registered nurses who have specialized graduate education.

**29-1161 Nurse Midwives**

Diagnose and coordinate all aspects of the birthing process, either independently or as part of a healthcare team. May provide well-woman gynecological care. Must have specialized, graduate nursing education.

**29-1171 Nurse Practitioners**

Diagnose and treat acute, episodic, or chronic illness, independently or as part of a healthcare team. May focus on health promotion and disease prevention. May order, perform, or interpret diagnostic tests such as lab work and x rays. May prescribe medication. Must be registered nurses who have specialized graduate education.

**29-1181 Audiologists**

Assess and treat persons with hearing and related disorders. May fit hearing aids and provide auditory training. May perform research related to hearing problems.

**29-1199 Health Diagnosing and Treating Practitioners, All Other**

All health diagnosing and treating practitioners not listed separately.

**29-2011 Medical and Clinical Laboratory Technologists**

Perform complex medical laboratory tests for diagnosis, treatment, and prevention of disease. May train or supervise staff.

**29-2012 Medical and Clinical Laboratory Technicians**

Perform routine medical laboratory tests for the diagnosis, treatment, and prevention of disease. May work under the supervision of a medical technologist.

**29-2021 Dental Hygienists**

Clean teeth and examine oral areas, head, and neck for signs of oral disease. May educate patients on oral hygiene, take and develop x rays, or apply fluoride or sealants.

**29-2031 Cardiovascular Technologists and Technicians**

Conduct tests on pulmonary or cardiovascular systems of patients for diagnostic purposes. May conduct or assist in electrocardiograms, cardiac catheterizations, pulmonary functions, lung capacity, and similar tests. Includes vascular technologists.

**29-2032 Diagnostic Medical Sonographers**

Produce ultrasonic recordings of internal organs for use by physicians.

**29-2033 Nuclear Medicine Technologists**

Prepare, administer, and measure radioactive isotopes in therapeutic, diagnostic, and tracer studies using a variety of radioisotope equipment. Prepare stock solutions of radioactive materials and calculate doses to be administered by radiologists. Subject patients to radiation. Execute blood volume, red cell survival, and fat absorption studies following standard laboratory techniques.

**29-2034 Radiologic Technologists**

Take x rays and CAT scans or administer nonradioactive materials into patient's blood stream for diagnostic purposes. Includes technologists who specialize in other scanning modalities. Excludes "Diagnostic Medical Sonographers"(29-2032) and "Magnetic Resonance Imaging Technologists" (29-2035).

**29-2035 Magnetic Resonance Imaging Technologists**

Operate Magnetic Resonance Imaging (MRI) scanners. Monitor patient safety and comfort, and view images of area being scanned to ensure quality of pictures. May administer gadolinium contrast dosage intravenously. May interview patient, explain MRI procedures, and position patient on examining table. May enter into the computer data such as patient history, anatomical area to be scanned, orientation specified, and position of entry.

**29-2041 Emergency Medical Technicians and Paramedics**

Assess injuries, administer emergency medical care, and extricate trapped individuals. Transport injured or sick persons to medical facilities.

**29-2051 Dietetic Technicians**

Assist in the provision of food service and nutritional programs, under the supervision of a dietitian. May plan and produce meals based on established guidelines, teach principles of food and nutrition, or counsel individuals.

**29-2052 Pharmacy Technicians**

Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications according to prescription orders.

#### 29-2053 Psychiatric Technicians

Care for individuals with mental or emotional conditions or disabilities, following the instructions of physicians or other health practitioners. Monitor patients' physical and emotional well-being and report to medical staff. May participate in rehabilitation and treatment programs, help with personal hygiene, and administer oral or injectable medications.

#### 29-2054 Respiratory Therapy Technicians

Provide respiratory care under the direction of respiratory therapists and physicians.

#### 29-2055 Surgical Technologists

Assist in operations, under the supervision of surgeons, registered nurses, or other surgical personnel. May help set up operating room, prepare and transport patients for surgery, adjust lights and equipment, pass instruments and other supplies to surgeons and surgeon's assistants, hold retractors, cut sutures, and help count sponges, needles, supplies, and instruments.

#### 29-2056 Veterinary Technologists and Technicians

Perform medical tests in a laboratory environment for use in the treatment and diagnosis of diseases in animals. Prepare vaccines and serums for prevention of diseases. Prepare tissue samples, take blood samples, and execute laboratory tests, such as urinalysis and blood counts. Clean and sterilize instruments and materials and maintain equipment and machines. May assist a veterinarian during surgery.

#### 29-2057 Ophthalmic Medical Technicians

Assist ophthalmologists by performing ophthalmic clinical functions. May administer eye exams, administer eye medications, and instruct the patient in care and use of corrective lenses.

#### 29-2061 Licensed Practical and Licensed Vocational Nurses

Care for ill, injured, or convalescing patients or persons with disabilities in hospitals, nursing homes, clinics, private homes, group homes, and similar institutions. May work under the supervision of a registered nurse. Licensing required.

#### 29-2071 Medical Records and Health Information Technicians

Compile, process, and maintain medical records of hospital and clinic patients in a manner consistent with medical, administrative, ethical, legal, and regulatory requirements of the health care system. Process, maintain, compile, and report patient information for health requirements and standards in a manner consistent with the healthcare industry's numerical coding system. Excludes "File Clerks" (43-4071).

#### 29-2081 Opticians, Dispensing

Design, measure, fit, and adapt lenses and frames for client according to written optical prescription or specification. Assist client with inserting, removing, and caring for contact lenses. Assist client with selecting frames. Measure customer for size of eyeglasses and coordinate frames with facial and eye measurements and optical prescription. Prepare work order for optical laboratory containing instructions for grinding and mounting lenses in frames. Verify exactness of finished lens spectacles. Adjust frame and lens position to fit client. May shape or reshape frames. Includes contact lens opticians.

#### 29-2091 Orthotists and Prosthetists

Design, measure, fit, and adapt orthopedic braces, appliances or prostheses, such as limbs or facial parts for patients with disabling conditions.

#### 29-2092 Hearing Aid Specialists

Select and fit hearing aids for customers. Administer and interpret tests of hearing. Assess hearing instrument efficacy. Take ear impressions and prepare, design, and modify ear molds. Excludes "Audiologists" (29-1181).

#### 29-2099 Health Technologists and Technicians, All Other

All health technologists and technicians not listed separately.

#### 29-9011 Occupational Health and Safety Specialists

Review, evaluate, and analyze work environments and design programs and procedures to control, eliminate, and prevent disease or injury caused by chemical, physical, and biological agents or ergonomic factors. May conduct inspections and enforce adherence to laws and regulations governing the health and safety of individuals. May be employed in the public or private sector. Includes environmental protection officers.

#### 29-9012 Occupational Health and Safety Technicians

Collect data on work environments for analysis by occupational health and safety specialists. Implement and conduct evaluation of programs designed to limit chemical, physical, biological, and ergonomic risks to workers.

#### 29-9091 Athletic Trainers

Evaluate and advise individuals to assist recovery from or avoid athletic-related injuries or illnesses, or maintain peak physical fitness. May provide first aid or emergency care.

#### 29-9092 Genetic Counselors

Assess individual or family risk for a variety of inherited conditions, such as genetic disorders and birth defects. Provide information to other healthcare providers or to individuals and families concerned with the risk of inherited conditions. Advise individuals and families to

support informed decision-making and coping methods for those at risk. May help conduct research related to genetic conditions or genetic counseling.

#### 29-9099 Healthcare Practitioners and Technical Workers, All Other

All healthcare practitioners and technical workers not listed separately.

#### 31-1011 Home Health Aides

Provide routine individualized healthcare such as changing bandages and dressing wounds, and applying topical medications to the elderly, convalescents, or persons with disabilities at the patient's home or in a care facility. Monitor or report changes in health status. May also provide personal care such as bathing, dressing, and grooming of patient.

#### 31-1013 Psychiatric Aides

Assist mentally impaired or emotionally disturbed patients, working under direction of nursing and medical staff. May assist with daily living activities, lead patients in educational and recreational activities, or accompany patients to and from examinations and treatments. May restrain violent patients. Includes psychiatric orderlies.

#### 31-1014 Nursing Assistants

Provide basic patient care under direction of nursing staff. Perform duties such as feed, bathe, dress, groom, or move patients, or change linens. May transfer or transport patients. Includes nursing care attendants, nursing aides, and nursing attendants. Excludes "Home Health Aides" (31-1011), "Orderlies" (31-1015), "Personal Care Aides" (39-9021), and "Psychiatric Aides" (31-1013).

#### 31-1015 Orderlies

Transport patients to areas such as operating rooms or x-ray rooms using wheelchairs, stretchers, or moveable beds. May maintain stocks of supplies or clean and transport equipment. Psychiatric orderlies are included in "Psychiatric Aides" (31-1013). Excludes "Nursing Assistants" (31-1014).

#### 31-2011 Occupational Therapy Assistants

Assist occupational therapists in providing occupational therapy treatments and procedures. May, in accordance with State laws, assist in development of treatment plans, carry out routine functions, direct activity programs, and document the progress of treatments. Generally requires formal training.

#### 31-2012 Occupational Therapy Aides

Under close supervision of an occupational therapist or occupational therapy assistant, perform only delegated, selected, or routine tasks in specific situations. These duties include preparing patient and treatment room.

### 31-2021 Physical Therapist Assistants

Assist physical therapists in providing physical therapy treatments and procedures. May, in accordance with State laws, assist in the development of treatment plans, carry out routine functions, document the progress of treatment, and modify specific treatments in accordance with patient status and within the scope of treatment plans established by a physical therapist. Generally requires formal training.

### 31-2022 Physical Therapist Aides

Under close supervision of a physical therapist or physical therapy assistant, perform only delegated, selected, or routine tasks in specific situations. These duties include preparing the patient and the treatment area.

### 31-9011 Massage Therapists

Perform therapeutic massages of soft tissues and joints. May assist in the assessment of range of motion and muscle strength, or propose client therapy plans.

### 31-9091 Dental Assistants

Assist dentist, set up equipment, prepare patient for treatment, and keep records.

### 31-9092 Medical Assistants

Perform administrative and certain clinical duties under the direction of a physician. Administrative duties may include scheduling appointments, maintaining medical records, billing, and coding information for insurance purposes. Clinical duties may include taking and recording vital signs and medical histories, preparing patients for examination, drawing blood, and administering medications as directed by physician. Excludes "Physician Assistants" (29-1071).

### 31-9093 Medical Equipment Preparers

Prepare, sterilize, install, or clean laboratory or healthcare equipment. May perform routine laboratory tasks and operate or inspect equipment.

### 31-9094 Medical Transcriptionists

Transcribe medical reports recorded by physicians and other healthcare practitioners using various electronic devices, covering office visits, emergency room visits, diagnostic imaging studies, operations, chart reviews, and final summaries. Transcribe dictated reports and translate abbreviations into fully understandable form. Edit as necessary and return reports in either printed or electronic form for review and signature, or correction.

### 31-9095 Pharmacy Aides

Record drugs delivered to the pharmacy, store incoming merchandise, and inform the supervisor of stock needs. May operate cash register and accept prescriptions for filling.

### 31-9096 Veterinary Assistants and Laboratory Animal Caretakers



Feed, water, and examine pets and other nonfarm animals for signs of illness, disease, or injury in laboratories and animal hospitals and clinics. Clean and disinfect cages and work areas, and sterilize laboratory and surgical equipment. May provide routine post-operative care, administer medication orally or topically, or prepare samples for laboratory examination under the supervision of veterinary or laboratory animal technologists or technicians, veterinarians, or scientists. Excludes "Nonfarm Animal Caretakers" (39-2021).

#### 31-9097 Phlebotomists

Draw blood for tests, transfusions, donations, or research. May explain the procedure to patients and assist in the recovery of patients with adverse reactions.

#### 31-9099 Healthcare Support Workers, All Other

All healthcare support workers not listed separately

#### 33-1011 First-Line Supervisors of Correctional Officers

Directly supervise and coordinate activities of correctional officers and jailers.

#### 33-1012 First-Line Supervisors of Police and Detectives

Directly supervise and coordinate activities of members of police force

#### 33-1021 First-Line Supervisors of Fire Fighting and Prevention Workers

Directly supervise and coordinate activities of workers engaged in fire fighting and fire prevention and control.

#### 33-1099 First-Line Supervisors of Protective Service Workers, All Other

All protective service supervisors not listed separately above.

#### 33-2011 Firefighters

Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster assistance.

#### 33-2021 Fire Inspectors and Investigators

Inspect buildings to detect fire hazards and enforce local ordinances and State laws, or investigate and gather facts to determine cause of fires and explosions.

#### 33-2022 Forest Fire Inspectors and Prevention Specialists

Enforce fire regulations, inspect forest for fire hazards and recommend forest fire prevention or control measures. May report forest fires and weather conditions.

#### 33-3011 Bailiffs

Maintain order in courts of law.

**33-3012 Correctional Officers and Jailers**

Guard inmates in penal or rehabilitative institutions in accordance with established regulations and procedures. May guard prisoners in transit between jail, courtroom, prison, or other point. Includes deputy sheriffs and police who spend the majority of their time guarding prisoners in correctional institutions.

**33-3021 Detectives and Criminal Investigators**

Conduct investigations related to suspected violations of Federal, State, or local laws to prevent or solve crimes. Excludes "Private Detectives and Investigators" (33-9021).

**33-3031 Fish and Game Wardens**

Patrol assigned area to prevent fish and game law violations. Investigate reports of damage to crops or property by wildlife. Compile biological data.

**33-3041 Parking Enforcement Workers**

Patrol assigned area, such as public parking lot or city streets to issue tickets to overtime parking violators and illegally parked vehicles.

**33-3051 Police and Sheriff's Patrol Officers**

Maintain order and protect life and property by enforcing local, tribal, State, or Federal laws and ordinances. Perform a combination of the following duties: patrol a specific area; direct traffic; issue traffic summonses; investigate accidents; apprehend and arrest suspects, or serve legal processes of courts.

**33-3052 Transit and Railroad Police**

Protect and police railroad and transit property, employees, or passengers.

**33-9011 Animal Control Workers**

Handle animals for the purpose of investigations of mistreatment, or control of abandoned, dangerous, or unattended animals.

**33-9021 Private Detectives and Investigators**

Gather, analyze, compile and report information regarding individuals or organizations to clients, or detect occurrences of unlawful acts or infractions of rules in private establishment.

**33-9031 Gaming Surveillance Officers and Gaming Investigators**

Act as oversight and security agent for management and customers. Observe casino or casino hotel operation for irregular activities such as cheating or theft by either employees or patrons. May use one-way mirrors above the casino floor, cashier's cage, and from desk. Use of audio/video equipment is also common to observe operation of the business. Usually required to provide verbal and written reports of all violations and suspicious behavior to supervisor.

### 33-9032 Security Guards

Guard, patrol, or monitor premises to prevent theft, violence, or infractions of rules. May operate x-ray and metal detector equipment. Excludes "Transportation Security Screeners" (33-9093).

### 33-9091 Crossing Guards

Guide or control vehicular or pedestrian traffic at such places as streets, schools, railroad crossings, or construction sites.

### 33-9092 Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers

Monitor recreational areas, such as pools, beaches, or ski slopes to provide assistance and protection to participants.

### 33-9093 Transportation Security Screeners

Conduct screening of passengers, baggage, or cargo to ensure compliance with Transportation Security Administration (TSA) regulations. May operate basic security equipment such as x-ray machines and hand wands at screening checkpoints.

### 33-9099 Protective Service Workers, All Other

All protective service workers not listed separately.

### 35-1011 Chefs and Head Cooks

Direct and may participate in the preparation, seasoning, and cooking of salads, soups, fish, meats, vegetables, desserts, or other foods. May plan and price menu items, order supplies, and keep records and accounts.

### 35-1012 First-Line Supervisors of Food Preparation and Serving Workers

Directly supervise and coordinate activities of workers engaged in preparing and serving food.

### 35-2011 Cooks, Fast Food

Prepare and cook food in a fast food restaurant with a limited menu. Duties of these cooks are limited to preparation of a few basic items and normally involve operating large-volume single-purpose cooking equipment.

### 35-2012 Cooks, Institution and Cafeteria

Prepare and cook large quantities of food for institutions, such as schools, hospitals, or cafeterias.

### 35-2013 Cooks, Private Household

Prepare meals in private homes. Includes personal chefs.

**35-2014 Cooks, Restaurant**

Prepare, season, and cook dishes such as soups, meats, vegetables, or desserts in restaurants. May order supplies, keep records and accounts, price items on menu, or plan menu.

**35-2015 Cooks, Short Order**

Prepare and cook to order a variety of foods that require only a short preparation time. May take orders from customers and serve patrons at counters or tables. Excludes "Fast Food Cooks" (35-2011).

**35-2019 Cooks, All Other**

All cooks not listed separately.

**35-2021 Food Preparation Workers**

Perform a variety of food preparation duties other than cooking, such as preparing cold foods and shellfish, slicing meat, and brewing coffee or tea.

**35-3011 Bartenders**

Mix and serve drinks to patrons, directly or through waitstaff.

**35-3021 Combined Food Preparation and Serving Workers, Including Fast Food**

Perform duties which combine preparing and serving food and nonalcoholic beverages.

**35-3022 Counter Attendants, Cafeteria, Food Concession, and Coffee Shop**

Serve food to diners at counter or from a steam table. Counter attendants who also wait tables are included in "Waiters and Waitresses" (35-3031).

**35-3031 Waiters and Waitresses**

Take orders and serve food and beverages to patrons at tables in dining establishment. Excludes "Counter Attendants, Cafeteria, Food Concession, and Coffee Shop" (35-3022).

**35-3041 Food Servers, Nonrestaurant**

Serve food to individuals outside of a restaurant environment, such as in hotel rooms, hospital rooms, residential care facilities, or cars. Excludes "Door-to-Door Sales Workers, News and Street Vendors, and Related Workers" (41-9091) and "Counter Attendants, Cafeteria, Food Concession, and Coffee Shop" (35-3022).

**35-9011 Dining Room and Cafeteria Attendants and Bartender Helpers**

Facilitate food service. Clean tables, remove dirty dishes, replace soiled table linens; set tables; replenish supply of clean linens, silverware, glassware, and dishes; supply service bar with food; and serve items such as water, condiments, and coffee to patrons.

**35-9021 Dishwashers**

Clean dishes, kitchen, food preparation equipment, or utensils.

**35-9031 Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop**

Welcome patrons, seat them at tables or in lounge, and help ensure quality of facilities and service.

**35-9099 Food Preparation and Serving Related Workers, All Other**

All food preparation and serving related workers not listed separately.

**37-1011 First-Line Supervisors of Housekeeping and Janitorial Workers**

Directly supervise and coordinate work activities of cleaning personnel in hotels, hospitals, offices, and other establishments.

**37-1012 First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers**

Directly supervise and coordinate activities of workers engaged in landscaping or groundskeeping activities. Work may involve reviewing contracts to ascertain service, machine, and workforce requirements; answering inquiries from potential customers regarding methods, material, and price ranges; and preparing estimates according to labor, material, and machine costs.

**37-2011 Janitors and Cleaners, Except Maids and Housekeeping Cleaners**

Keep buildings in clean and orderly condition. Perform heavy cleaning duties, such as cleaning floors, shampooing rugs, washing walls and glass, and removing rubbish. Duties may include tending furnace and boiler, performing routine maintenance activities, notifying management of need for repairs, and cleaning snow or debris from sidewalk.

**37-2012 Maids and Housekeeping Cleaners**

Perform any combination of light cleaning duties to maintain private households or commercial establishments, such as hotels and hospitals, in a clean and orderly manner. Duties may include making beds, replenishing linens, cleaning rooms and halls, and vacuuming.

**37-2019 Building Cleaning Workers, All Other**

All building cleaning workers not listed separately.

**37-2021 Pest Control Workers**

Apply or release chemical solutions or toxic gases and set traps to kill or remove pests and vermin that infest buildings and surrounding areas.

### 37-3011 Landscaping and Groundskeeping Workers

Landscape or maintain grounds of property using hand or power tools or equipment. Workers typically perform a variety of tasks, which may include any combination of the following: sod laying, mowing, trimming, planting, watering, fertilizing, digging, raking, sprinkler installation, and installation of mortarless segmental concrete masonry wall units. Excludes "Farmworkers and Laborers, Crop, Nursery, and Greenhouse" (45-2092).

### 37-3012 Pesticide Handlers, Sprayers, and Applicators, Vegetation

Mix or apply pesticides, herbicides, fungicides, or insecticides through sprays, dusts, vapors, soil incorporation, or chemical application on trees, shrubs, lawns, or botanical crops. Usually requires specific training and State or Federal certification. Excludes "Commercial Pilots" (53-2012) who dust or spray crops from aircraft.

### 37-3013 Tree Trimmers and Pruners

Using sophisticated climbing and rigging techniques, cut away dead or excess branches from trees or shrubs to maintain right-of-way for roads, sidewalks, or utilities, or to improve appearance, health, and value of tree. Prune or treat trees or shrubs using handsaws, hand pruners, clippers, and power pruners. Works off the ground in the tree canopy and may use truck-mounted lifts. Excludes workers who primarily perform duties of "Pesticide Handlers, Sprayers, and Applicators, Vegetation" (37-3012) and "Landscaping and Groundskeeping Workers" (37-3011).

### 37-3019 Grounds Maintenance Workers, All Other

All grounds maintenance workers not listed separately.

### 39-1011 Gaming Supervisors

Supervise and coordinate activities of workers in assigned gaming areas. Circulate among tables and observe operations. Ensure that stations and games are covered for each shift. May explain and interpret operating rules of house to patrons. May plan and organize activities and services for guests in hotels/casinos. May address service complaints. Excludes "Slot Supervisors" (39-1012).

### 39-1012 Slot Supervisors

Supervise and coordinate activities of slot department workers to provide service to patrons. Handle and settle complaints of players. Verify and pay off jackpots. Reset slot machines after payoffs. Make repairs or adjustments to slot machines or recommend removal of slot machines for repair. Report hazards and enforce safety rules.

### 39-1021 First-Line Supervisors of Personal Service Workers

Directly supervise and coordinate activities of personal service workers, such as flight attendants, hairdressers, or caddies.

### 39-2011 Animal Trainers

Train animals for riding, harness, security, performance, or obedience, or assisting persons with disabilities. Accustom animals to human voice and contact; and condition animals to respond to commands. Train animals according to prescribed standards for show or competition. May train animals to carry pack loads or work as part of pack team.

### 39-2021 Nonfarm Animal Caretakers

Feed, water, groom, bathe, exercise, or otherwise care for pets and other nonfarm animals, such as dogs, cats, ornamental fish or birds, zoo animals, and mice. Work in settings such as kennels, animal shelters, zoos, circuses, and aquariums. May keep records of feedings, treatments, and animals received or discharged. May clean, disinfect, and repair cages, pens, or fish tanks. Excludes "Veterinary Assistants and Laboratory Animal Caretakers" (31-9096).

### 39-3011 Gaming Dealers

Operate table games. Stand or sit behind table and operate games of chance by dispensing the appropriate number of cards or blocks to players, or operating other gaming equipment. Distribute winnings or collect players' money or chips. May compare the house's hand against players' hands.

### 39-3012 Gaming and Sports Book Writers and Runners

Post information enabling patrons to wager on various races and sporting events. Assist in the operation of games such as keno and bingo. May operate random number generating equipment and announce the numbers for patrons. Receive, verify, and record patrons' wagers. Scan and process winning tickets presented by patrons and payout winnings for those wagers.

### 39-3019 Gaming Service Workers, All Other

All gaming service workers not listed separately.

### 39-3021 Motion Picture Projectionists

Set up and operate motion picture projection and related sound reproduction equipment.

### 39-3031 Ushers, Lobby Attendants, and Ticket Takers

Assist patrons at entertainment events by performing duties, such as collecting admission tickets and passes from patrons, assisting in finding seats, searching for lost articles, and locating such facilities as rest rooms and telephones.

### 39-3091 Amusement and Recreation Attendants

Perform variety of attending duties at amusement or recreation facility. May schedule use of recreation facilities, maintain and provide equipment to participants of sporting events or recreational pursuits, or operate amusement concessions and rides.

**39-3092 Costume Attendants**

Select, fit, and take care of costumes for cast members, and aid entertainers. May assist with multiple costume changes during performances.

**39-3093 Locker Room, Coatroom, and Dressing Room Attendants**

Provide personal items to patrons or customers in locker rooms, dressing rooms, or coatrooms.

**39-3099 Entertainment Attendants and Related Workers, All Other**

All entertainment attendants and related workers not listed separately.

**39-4011 Embalmers**

Prepare bodies for interment in conformity with legal requirements.

**39-4021 Funeral Attendants**

Perform variety of tasks during funeral, such as placing casket in parlor or chapel prior to service; arranging floral offerings or lights around casket; directing or escorting mourners; closing casket; and issuing and storing funeral equipment.

**39-4031 Morticians, Undertakers, and Funeral Directors**

Perform various tasks to arrange and direct funeral services, such as coordinating transportation of body to mortuary, interviewing family or other authorized person to arrange details, selecting pallbearers, aiding with the selection of officials for religious rites, and providing transportation for mourners. Excludes "Funeral Service Managers" (11-9061).

**39-5011 Barbers**

Provide barbering services, such as cutting, trimming, shampooing, and styling hair, trimming beards, or giving shaves.

**39-5012 Hairdressers, Hairstylists, and Cosmetologists**

Provide beauty services, such as shampooing, cutting, coloring, and styling hair, and massaging and treating scalp. May apply makeup, dress wigs, perform hair removal, and provide nail and skin care services. Excludes "Makeup Artists, Theatrical and Performance" (39-5091), "Manicurists and Pedicurists" (39-5092), and "Skincare Specialists" (39-5094).

**39-5091 Makeup Artists, Theatrical and Performance**

Apply makeup to performers to reflect period, setting, and situation of their role.

**39-5092 Manicurists and Pedicurists**

Clean and shape customers' fingernails and toenails. May polish or decorate nails.



### 39-5093 Shampooers

Shampoo and rinse customers' hair.

### 39-5094 Skincare Specialists

Provide skincare treatments to face and body to enhance an individual's appearance. Includes electrologists and laser hair removal specialists.

### 39-6011 Baggage Porters and Bellhops

Handle baggage for travelers at transportation terminals or for guests at hotels or similar establishments.

### 39-6012 Concierges

Assist patrons at hotel, apartment, or office building with personal services. May take messages, arrange or give advice on transportation, business services or entertainment, or monitor guest requests for housekeeping and maintenance.

### 39-7011 Tour Guides and Escorts

Escort individuals or groups on sightseeing tours or through places of interest, such as industrial establishments, public buildings, and art galleries.

### 39-7012 Travel Guides

Plan, organize, and conduct long distance travel, tours, and expeditions for individuals and groups.

### 39-9011 Childcare Workers

Attend to children at schools, businesses, private households, and childcare institutions. Perform a variety of tasks, such as dressing, feeding, bathing, and overseeing play. Excludes "Preschool Teachers, Except Special Education" (25-2011) and "Teacher Assistants" (25-9041).

### 39-9021 Personal Care Aides

Assist the elderly, convalescents, or persons with disabilities with daily living activities at the person's home or in a care facility. Duties performed at a place of residence may include keeping house (making beds, doing laundry, washing dishes) and preparing meals. May provide assistance at non-residential care facilities. May advise families, the elderly, convalescents, and persons with disabilities regarding such things as nutrition, cleanliness, and household activities.

### 39-9031 Fitness Trainers and Aerobics Instructors

Instruct or coach groups or individuals in exercise activities. Demonstrate techniques and form, observe participants, and explain to them corrective measures necessary to improve

their skills. Excludes teachers classified in 25-0000 Education, Training, and Library Occupations. Excludes "Coaches and Scouts" (27-2022) and "Athletic Trainers" (29-9091).

#### 39-9032 Recreation Workers

Conduct recreation activities with groups in public, private, or volunteer agencies or recreation facilities. Organize and promote activities, such as arts and crafts, sports, games, music, dramatics, social recreation, camping, and hobbies, taking into account the needs and interests of individual members.

#### 39-9041 Residential Advisors

Coordinate activities in resident facilities in secondary and college dormitories, group homes, or similar establishments. Order supplies and determine need for maintenance, repairs, and furnishings. May maintain household records and assign rooms. May assist residents with problem solving or refer them to counseling resources.

#### 39-9099 Personal Care and Service Workers, All Other

All personal care and service workers not listed separately.

#### 41-1011 First-Line Supervisors of Retail Sales Workers

Directly supervise and coordinate activities of retail sales workers in an establishment or department. Duties may include management functions, such as purchasing, budgeting, accounting, and personnel work, in addition to supervisory duties.

#### 41-1012 First-Line Supervisors of Non-Retail Sales Workers

Directly supervise and coordinate activities of sales workers other than retail sales workers. May perform duties, such as budgeting, accounting, and personnel work, in addition to supervisory duties.

#### 41-2011 Cashiers

Receive and disburse money in establishments other than financial institutions. May use electronic scanners, cash registers, or related equipment. May process credit or debit card transactions and validate checks. Excludes "Gaming Cage Persons and Booth Cashiers" (41-2012).

#### 41-2012 Gaming Change Persons and Booth Cashiers

Exchange coins, tokens and chips for patrons' money. May issue payoffs and obtain customer's signature on receipt. May operate a booth in the slot machine area and furnish change persons with money bank at the start of the shift, or count and audit money in drawers. Excludes "Cashiers" (41-2011).

#### 41-2021 Counter and Rental Clerks

Receive orders, generally in person, for repairs, rentals, and services. May describe available options, compute cost, and accept payment. Excludes "Counter Attendants,

Cafeteria, Food Concession, and Coffee Shop" (35-3022), "Hotel, Motel, and Resort Desk Clerks" (43-4081), "Order Clerks" (43-4151), and "Reservation and Transportation Ticket Agents and Travel Clerks" (43-4181).

#### 41-2022 Parts Salespersons

Sell spare and replacement parts and equipment in repair shop or parts store.

#### 41-2031 Retail Salespersons

Sell merchandise, such as furniture, motor vehicles, appliances, or apparel to consumers. Excludes "Cashiers" (41-2011).

#### 41-3011 Advertising Sales Agents

Sell or solicit advertising space, time, or media in publications, signage, TV, radio, or Internet establishments or public spaces.

#### 41-3021 Insurance Sales Agents

Sell life, property, casualty, health, automotive, or other types of insurance. May refer clients to independent brokers, work as an independent broker, or be employed by an insurance company.

#### 41-3031 Securities, Commodities, and Financial Services Sales Agents

Buy and sell securities or commodities in investment and trading firms, or provide financial services to businesses and individuals. May advise customers about stocks, bonds, mutual funds, commodities, and market conditions.

#### 41-3041 Travel Agents

Plan and sell transportation and accommodations for travel agency customers. Determine destination, modes of transportation, travel dates, costs, and accommodations required. May also describe, plan, and arrange itineraries and sell tour packages. May assist in resolving clients' travel problems.

#### 41-3099 Sales Representatives, Services, All Other

All services sales representatives not listed separately.

#### 41-4011 Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products

Sell goods for wholesalers or manufacturers where technical or scientific knowledge is required in such areas as biology, engineering, chemistry, and electronics, normally obtained from at least 2 years of post-secondary education. Excludes "Sales Engineers" (41-9031).

#### 41-4012 Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products

Sell goods for wholesalers or manufacturers to businesses or groups of individuals. Work requires substantial knowledge of items sold.

#### 41-9011 Demonstrators and Product Promoters

Demonstrate merchandise and answer questions for the purpose of creating public interest in buying the product. May sell demonstrated merchandise.

#### 41-9012 Models

Model garments or other apparel and accessories for prospective buyers at fashion shows, private showings, or retail establishments. May pose for photos to be used in magazines or advertisements. May pose as subject for paintings, sculptures, and other types of artistic expression.

#### 41-9021 Real Estate Brokers

Operate real estate office, or work for commercial real estate firm, overseeing real estate transactions. Other duties usually include selling real estate or renting properties and arranging loans.

#### 41-9022 Real Estate Sales Agents

Rent, buy, or sell property for clients. Perform duties, such as study property listings, interview prospective clients, accompany clients to property site, discuss conditions of sale, and draw up real estate contracts. Includes agents who represent buyer.

#### 41-9031 Sales Engineers

Sell business goods or services, the selling of which requires a technical background equivalent to a baccalaureate degree in engineering. Excludes "Engineers" (17-2011 through 17-2199) whose primary function is not marketing or sales.

#### 41-9041 Telemarketers

Solicit donations or orders for goods or services over the telephone.

#### 41-9091 Door-to-Door Sales Workers, News and Street Vendors, and Related Workers

Sell goods or services door-to-door or on the street.

#### 41-9099 Sales and Related Workers, All Other

All sales and related workers not listed separately.

#### 43-1011 First-Line Supervisors of Office and Administrative Support Workers

Directly supervise and coordinate the activities of clerical and administrative support workers.

#### 43-2011 Switchboard Operators, Including Answering Service

Operate telephone business systems equipment or switchboards to relay incoming, outgoing, and interoffice calls. May supply information to callers and record messages.

#### 43-2021 Telephone Operators

Provide information by accessing alphabetical, geographical, or other directories. Assist customers with special billing requests, such as charges to a third party and credits or refunds for incorrectly dialed numbers or bad connections. May handle emergency calls and assist children or people with physical disabilities to make telephone calls.

#### 43-2099 Communications Equipment Operators, All Other

All communications equipment operators not listed separately.

#### 43-3011 Bill and Account Collectors

Locate and notify customers of delinquent accounts by mail, telephone, or personal visit to solicit payment. Duties include receiving payment and posting amount to customer's account; preparing statements to credit department if customer fails to respond; initiating repossession proceedings or service disconnection; and keeping records of collection and status of accounts.

#### 43-3021 Billing and Posting Clerks

Compile, compute, and record billing, accounting, statistical, and other numerical data for billing purposes. Prepare billing invoices for services rendered or for delivery or shipment of goods.

#### 43-3031 Bookkeeping, Accounting, and Auditing Clerks

Compute, classify, and record numerical data to keep financial records complete. Perform any combination of routine calculating, posting, and verifying duties to obtain primary financial data for use in maintaining accounting records. May also check the accuracy of figures, calculations, and postings pertaining to business transactions recorded by other workers. Excludes "Payroll and Timekeeping Clerks" (43-3051).

#### 43-3041 Gaming Cage Workers

In a gaming establishment, conduct financial transactions for patrons. May reconcile daily summaries of transactions to balance books. Accept patron's credit application and verify credit references to provide check-cashing authorization or to establish house credit accounts. May sell gambling chips, tokens, or tickets to patrons, or to other workers for resale

to patrons. May convert gaming chips, tokens, or tickets to currency upon patron's request. May use a cash register or computer to record transaction.

#### 43-3051 Payroll and Timekeeping Clerks

Compile and record employee time and payroll data. May compute employees' time worked, production, and commission. May compute and post wages and deductions, or prepare paychecks. Excludes "Bookkeeping, Accounting, and Auditing Clerks" (43-3031).

#### 43-3061 Procurement Clerks

Compile information and records to draw up purchase orders for procurement of materials and services.

#### 43-3071 Tellers

Receive and pay out money. Keep records of money and negotiable instruments involved in a financial institution's various transactions.

#### 43-3099 Financial Clerks, All Other

All financial clerks not listed separately.

#### 43-4011 Brokerage Clerks

Perform duties related to the purchase, sale or holding of securities. Duties include writing orders for stock purchases or sales, computing transfer taxes, verifying stock transactions, accepting and delivering securities, tracking stock price fluctuations, computing equity, distributing dividends, and keeping records of daily transactions and holdings.

#### 43-4021 Correspondence Clerks

Compose letters or electronic correspondence in reply to requests for merchandise, damage claims, credit and other information, delinquent accounts, incorrect billings, or unsatisfactory services. Duties may include gathering data to formulate reply and preparing correspondence.

#### 43-4031 Court, Municipal, and License Clerks

Perform clerical duties for courts of law, municipalities, or governmental licensing agencies and bureaus. May prepare docket of cases to be called; secure information for judges and court; prepare draft agendas or bylaws for town or city council; answer official correspondence; keep fiscal records and accounts; issue licenses or permits; and record data, administer tests, or collect fees. Clerks of Court are classified in "Managers, All Other" (11-9199).

#### 43-4041 Credit Authorizers, Checkers, and Clerks

Authorize credit charges against customers' accounts. Investigate history and credit standing of individuals or business establishments applying for credit. May interview applicants to

obtain personal and financial data; determine credit worthiness; process applications; and notify customers of acceptance or rejection of credit.

#### 43-4051 Customer Service Representatives

Interact with customers to provide information in response to inquiries about products and services and to handle and resolve complaints. Excludes individuals whose duties are primarily installation, sales, or repair.

#### 43-4061 Eligibility Interviewers, Government Programs

Determine eligibility of persons applying to receive assistance from government programs and agency resources, such as welfare, unemployment benefits, social security, and public housing.

#### 43-4071 File Clerks

File correspondence, cards, invoices, receipts, and other records in alphabetical or numerical order or according to the filing system used. Locate and remove material from file when requested.

#### 43-4081 Hotel, Motel, and Resort Desk Clerks

Accommodate hotel, motel, and resort patrons by registering and assigning rooms to guests, issuing room keys or cards, transmitting and receiving messages, keeping records of occupied rooms and guests' accounts, making and confirming reservations, and presenting statements to and collecting payments from departing guests.

#### 43-4111 Interviewers, Except Eligibility and Loan

Interview persons by telephone, mail, in person, or by other means for the purpose of completing forms, applications, or questionnaires. Ask specific questions, record answers, and assist persons with completing form. May sort, classify, and file forms.

#### 43-4121 Library Assistants, Clerical

Compile records, sort, shelve, issue, and receive library materials such as books, electronic media, pictures, cards, slides and microfilm. Locate library materials for loan and replace material in shelving area, stacks, or files according to identification number and title. Register patrons to permit them to borrow books, periodicals, and other library materials. Excludes "Library Technicians" (25-4031).

#### 43-4131 Loan Interviewers and Clerks

Interview loan applicants to elicit information; investigate applicants' backgrounds and verify references; prepare loan request papers; and forward findings, reports, and documents to appraisal department. Review loan papers to ensure completeness, and complete transactions between loan establishment, borrowers, and sellers upon approval of loan.

#### 43-4141 New Accounts Clerks

Interview persons desiring to open accounts in financial institutions. Explain account services available to prospective customers and assist them in preparing applications.

#### 43-4151 Order Clerks

Receive and process incoming orders for materials, merchandise, classified ads, or services such as repairs, installations, or rental of facilities. Generally receives orders via mail, phone, fax, or other electronic means. Duties include informing customers of receipt, prices, shipping dates, and delays; preparing contracts; and handling complaints. Excludes "Dispatchers, Except Police, Fire, and Ambulance" (43-5032) who both dispatch and take orders for services.

#### 43-4161 Human Resources Assistants, Except Payroll and Timekeeping

Compile and keep personnel records. Record data for each employee, such as address, weekly earnings, absences, amount of sales or production, supervisory reports, and date of and reason for termination. May prepare reports for employment records, file employment records, or search employee files and furnish information to authorized persons.

#### 43-4171 Receptionists and Information Clerks

Answer inquiries and provide information to the general public, customers, visitors, and other interested parties regarding activities conducted at establishment and location of departments, offices, and employees within the organization. Excludes "Switchboard Operators, Including Answering Service" (43-2011).

#### 43-4181 Reservation and Transportation Ticket Agents and Travel Clerks

Make and confirm reservations for transportation or lodging, or sell transportation tickets. May check baggage and direct passengers to designated concourse, pier, or track; deliver tickets, contact individuals and groups to inform them of package tours; or provide tourists with travel or transportation information. Excludes "Travel Agents" (41-3041), "Hotel, Motel, and Resort Desk Clerks" (43-4081), and "Cashiers" (41-2011) who sell tickets for local transportation.

#### 43-4199 Information and Record Clerks, All Other

All information and record clerks not listed separately.

#### 43-5011 Cargo and Freight Agents

Expedite and route movement of incoming and outgoing cargo and freight shipments in airline, train, and trucking terminals, and shipping docks. Take orders from customers and arrange pickup of freight and cargo for delivery to loading platform. Prepare and examine bills of lading to determine shipping charges and tariffs.



**43-5021 Couriers and Messengers**

Pick up and deliver messages, documents, packages, and other items between offices or departments within an establishment or directly to other business concerns, traveling by foot, bicycle, motorcycle, automobile, or public conveyance. Excludes "Light Truck or Delivery Services Drivers" (53-3033).

**43-5031 Police, Fire, and Ambulance Dispatchers**

Operate radio, telephone, or computer equipment at emergency response centers. Receive reports from the public of crimes, disturbances, fires, and medical or police emergencies. Relay information to law enforcement and emergency response personnel. May maintain contact with caller until responders arrive.

**43-5032 Dispatchers, Except Police, Fire, and Ambulance**

Schedule and dispatch workers, work crews, equipment, or service vehicles for conveyance of materials, freight, or passengers, or for normal installation, service, or emergency repairs rendered outside the place of business. Duties may include using radio, telephone, or computer to transmit assignments and compiling statistics and reports on work progress.

**43-5041 Meter Readers, Utilities**

Read meter and record consumption of electricity, gas, water, or steam.

**43-5051 Postal Service Clerks**

Perform any combination of tasks in a post office, such as receive letters and parcels; sell postage and revenue stamps, postal cards, and stamped envelopes; fill out and sell money orders; place mail in pigeon holes of mail rack or in bags; and examine mail for correct postage.

**43-5052 Postal Service Mail Carriers**

Sort mail for delivery. Deliver mail on established route by vehicle or on foot.

**43-5053 Postal Service Mail Sorters, Processors, and Processing Machine Operators**

Prepare incoming and outgoing mail for distribution. Examine, sort, and route mail. Load, operate, and occasionally adjust and repair mail processing, sorting, and canceling machinery. Keep records of shipments, pouches, and sacks; and other duties related to mail handling within the postal service. Excludes "Postal Service Clerks" (43-5051) and "Postal Service Mail Carriers" (43-5052).

**43-5061 Production, Planning, and Expediting Clerks**

Coordinate and expedite the flow of work and materials within or between departments of an establishment according to production schedule. Duties include reviewing and distributing production, work, and shipment schedules; conferring with department supervisors to determine progress of work and completion dates; and compiling reports on progress of

work, inventory levels, costs, and production problems. Excludes "Weighers, Measurers, Checkers, and Samplers, Recordkeeping" (43-5111).

#### 43-5071 Shipping, Receiving, and Traffic Clerks

Verify and maintain records on incoming and outgoing shipments. Prepare items for shipment. Duties include assembling, addressing, stamping, and shipping merchandise or material; receiving, unpacking, verifying and recording incoming merchandise or material; and arranging for the transportation of products. Excludes "Stock Clerks and Order Fillers" (43-5081) and "Weighers, Measurers, Checkers, and Samplers, Recordkeeping" (43-5111).

#### 43-5081 Stock Clerks and Order Fillers

Receive, store, and issue sales floor merchandise, materials, equipment, and other items from stockroom, warehouse, or storage yard to fill shelves, racks, tables, or customers' orders. May mark prices on merchandise and set up sales displays. Excludes "Laborers and Freight, Stock, and Material Movers, Hand" (53-7062), and "Shipping, Receiving, and Traffic Clerks" (43-5071).

#### 43-5111 Weighers, Measurers, Checkers, and Samplers, Recordkeeping

Weigh, measure, and check materials, supplies, and equipment for the purpose of keeping relevant records. Duties are primarily clerical by nature. Includes workers who collect and keep record of samples of products or materials. Excludes "Inspectors, Testers, Sorters, Samplers, and Weighers" (51-9061).

#### 43-6011 Executive Secretaries and Executive Administrative Assistants

Provide high-level administrative support by conducting research, preparing statistical reports, handling information requests, and performing clerical functions such as preparing correspondence, receiving visitors, arranging conference calls, and scheduling meetings. May also train and supervise lower-level clerical staff. Excludes "Secretaries" (43-6012 through 43-6014).

#### 43-6012 Legal Secretaries

Perform secretarial duties using legal terminology, procedures, and documents. Prepare legal papers and correspondence, such as summonses, complaints, motions, and subpoenas. May also assist with legal research.

#### 43-6013 Medical Secretaries

Perform secretarial duties using specific knowledge of medical terminology and hospital, clinic, or laboratory procedures. Duties may include scheduling appointments, billing patients, and compiling and recording medical charts, reports, and correspondence.

#### 43-6014 Secretaries and Administrative Assistants, Except Legal, Medical, and Executive

Perform routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or

providing information to callers. Excludes legal, medical, and executive secretaries (43-6011 through 43-6013).

#### 43-9011 Computer Operators

Monitor and control electronic computer and peripheral electronic data processing equipment to process business, scientific, engineering, and other data according to operating instructions. Monitor and respond to operating and error messages. May enter commands at a computer terminal and set controls on computer and peripheral devices. Excludes "Computer Occupations" (15-1100) and "Data Entry Keyers" (43-9021).

#### 43-9021 Data Entry Keyers

Operate data entry device, such as keyboard or photo composing perforator. Duties may include verifying data and preparing materials for printing. Excludes "Word Processors and Typists" (43-9022).

#### 43-9022 Word Processors and Typists

Use word processor, computer or typewriter to type letters, reports, forms, or other material from rough draft, corrected copy, or voice recording. May perform other clerical duties as assigned. Excludes "Data Entry Keyers" (43-9021), "Secretaries and Administrative Assistants" (43-6011 through 43-6014), "Court Reporters" (23-2091), and "Medical Transcriptionists" (31-9094).

#### 43-9031 Desktop Publishers

Format typescript and graphic elements using computer software to produce publication-ready material.

#### 43-9041 Insurance Claims and Policy Processing Clerks

Process new insurance policies, modifications to existing policies, and claims forms. Obtain information from policyholders to verify the accuracy and completeness of information on claims forms, applications and related documents, and company records. Update existing policies and company records to reflect changes requested by policyholders and insurance company representatives. Excludes "Claims Adjusters, Examiners, and Investigators" (13-1031).

#### 43-9051 Mail Clerks and Mail Machine Operators, Except Postal Service

Prepare incoming and outgoing mail for distribution. Use hand or mail handling machines to time stamp, open, read, sort, and route incoming mail; and address, seal, stamp, fold, stuff, and affix postage to outgoing mail or packages. Duties may also include keeping necessary records and completed forms.

#### 43-9061 Office Clerks, General

Perform duties too varied and diverse to be classified in any specific office clerical occupation, requiring knowledge of office systems and procedures. Clerical duties may be

assigned in accordance with the office procedures of individual establishments and may include a combination of answering telephones, bookkeeping, typing or word processing, stenography, office machine operation, and filing.

#### 43-9071 Office Machine Operators, Except Computer

Operate one or more of a variety of office machines, such as photocopying, photographic, and duplicating machines, or other office machines. Excludes "Computer Operators" (43-9011), "Mail Clerks and Mail Machine Operators, Except Postal Service" (43-9051) and "Billing and Posting Clerks" (43-3021).

#### 43-9081 Proofreaders and Copy Markers

Read transcript or proof type setup to detect and mark for correction any grammatical, typographical, or compositional errors. Excludes workers whose primary duty is editing copy. Includes proofreaders of Braille.

#### 43-9111 Statistical Assistants

Compile and compute data according to statistical formulas for use in statistical studies. May perform actuarial computations and compile charts and graphs for use by actuaries. Includes actuarial clerks.

#### 43-9199 Office and Administrative Support Workers, All Other

All office and administrative support workers not listed separately.

#### 45-1011 First-Line Supervisors of Farming, Fishing, and Forestry Workers

Directly supervise and coordinate the activities of agricultural, forestry, aquacultural, and related workers. Excludes "First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers" (37-1012).

#### 45-2011 Agricultural Inspectors

Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.

#### 45-2021 Animal Breeders

Select and breed animals according to their genealogy, characteristics, and offspring. May require knowledge of artificial insemination techniques and equipment use. May involve keeping records on heats, birth intervals, or pedigree. Excludes "Nonfarm Animal Caretakers" (39-2021) who may occasionally breed animals as part of their other caretaking duties. Excludes "Animal Scientists" (19-1011) whose primary function is research.

#### 45-2041 Graders and Sorters, Agricultural Products

Grade, sort, or classify unprocessed food and other agricultural products by size, weight, color, or condition. Excludes "Agricultural Inspectors" (45-2011).

#### 45-2091 Agricultural Equipment Operators

Drive and control farm equipment to till soil and to plant, cultivate, and harvest crops. May perform tasks, such as crop baling or hay bucking. May operate stationary equipment to perform post-harvest tasks, such as husking, shelling, threshing, and ginning.

#### 45-2092 Farmworkers and Laborers, Crop, Nursery, and Greenhouse

Manually plant, cultivate, and harvest vegetables, fruits, nuts, horticultural specialties, and field crops. Use hand tools, such as shovels, trowels, hoes, tampers, pruning hooks, shears, and knives. Duties may include tilling soil and applying fertilizers; transplanting, weeding, thinning, or pruning crops; applying pesticides; or cleaning, grading, sorting, packing, and loading harvested products. May construct trellises, repair fences and farm buildings, or participate in irrigation activities. Excludes "Graders and Sorters, Agricultural Products" (45-2041) and "Forest, Conservation, and Logging Workers" (45-4011 through 45-4029).

#### 45-2093 Farmworkers, Farm, Ranch, and Aquacultural Animals

Attend to live farm, ranch, or aquacultural animals that may include cattle, sheep, swine, goats, horses and other equines, poultry, finfish, shellfish, and bees. Attend to animals produced for animal products, such as meat, fur, skins, feathers, eggs, milk, and honey. Duties may include feeding, watering, herding, grazing, castrating, branding, de-beaking, weighing, catching, and loading animals. May maintain records on animals; examine animals to detect diseases and injuries; assist in birth deliveries; and administer medications, vaccinations, or insecticides as appropriate. May clean and maintain animal housing areas. Includes workers who shear wool from sheep, and collect eggs in hatcheries

#### 45-2099 Agricultural Workers, All Other

All agricultural workers not listed separately.

#### 45-3011 Fishers and Related Fishing Workers

Use nets, fishing rods, traps, or other equipment to catch and gather fish or other aquatic animals from rivers, lakes, or oceans, for human consumption or other uses. May haul game onto ship. Aquacultural laborers who work on fish farms are included in "Farmworkers, Farm, Ranch, and Aquacultural Animals" (45-2093).

#### 45-3021 Hunters and Trappers

Hunt and trap wild animals for human consumption, fur, feed, bait, or other purposes.

#### 45-4011 Forest and Conservation Workers

Under supervision, perform manual labor necessary to develop, maintain, or protect areas such as forests, forested areas, woodlands, wetlands, and rangelands through such activities as raising and transporting seedlings; combating insects, pests, and diseases harmful to plant life; and building structures to control water, erosion, and leaching of soil. Includes forester aides, seedling pullers, and tree planters.

**45-4021 Fallers**

Use axes or chainsaws to fell trees using knowledge of tree characteristics and cutting techniques to control direction of fall and minimize tree damage.

**45-4022 Logging Equipment Operators**

Drive logging tractor or wheeled vehicle equipped with one or more accessories, such as bulldozer blade, frontal shear, grapple, logging arch, cable winches, hoisting rack, or crane boom, to fell tree; to skid, load, unload, or stack logs; or to pull stumps or clear brush. Logging truck drivers are included in "Heavy and Tractor Trailer Truck Drivers" (53-3032).

**45-4023 Log Graders and Scalers**

Grade logs or estimate the marketable content or value of logs or pulpwood in sorting yards, millpond, log deck, or similar locations. Inspect logs for defects or measure logs to determine volume. Excludes "Buyers and Purchasing Agents, Farm Products" (13-1021).

**45-4029 Logging Workers, All Other**

All logging workers not listed separately.

**47-1011 Supervisors of Construction and Extraction Workers**

Directly supervise and coordinate activities of construction or extraction workers.

**47-2011 Boilermakers**

Construct, assemble, maintain, and repair stationary steam boilers and boiler house auxiliaries. Align structures or plate sections to assemble boiler frame tanks or vats, following blueprints. Work involves use of hand and power tools, plumb bobs, levels, wedges, dogs, or turnbuckles. Assist in testing assembled vessels. Direct cleaning of boilers and boiler furnaces. Inspect and repair boiler fittings, such as safety valves, regulators, automatic-control mechanisms, water columns, and auxiliary machines.

**47-2021 Brickmasons and Blockmasons**

Lay and bind building materials, such as brick, structural tile, concrete block, cinder block, glass block, and terra-cotta block, with mortar and other substances to construct or repair walls, partitions, arches, sewers, and other structures. Excludes "Stonemasons" (47-2022). Installers of mortarless segmental concrete masonry wall units are classified in "Landscaping and Groundskeeping Workers" (37-3011).

**47-2022 Stonemasons**

Build stone structures, such as piers, walls, and abutments. Lay walks, curbstones, or special types of masonry for vats, tanks, and floors.

#### 47-2031 Carpenters

Construct, erect, install, or repair structures and fixtures made of wood, such as concrete forms; building frameworks, including partitions, joists, studding, and rafters; and wood stairways, window and door frames, and hardwood floors. May also install cabinets, siding, drywall and batt or roll insulation. Includes brattice builders who build doors or brattices (ventilation walls or partitions) in underground passageways

#### 47-2041 Carpet Installers

Lay and install carpet from rolls or blocks on floors. Install padding and trim flooring materials. Excludes "Floor Layers, Except Carpet, Wood, and Hard Tiles" (47-2042).

#### 47-2042 Floor Layers, Except Carpet, Wood, and Hard Tiles

Apply blocks, strips, or sheets of shock-absorbing, sound-deadening, or decorative coverings to floors.

#### 47-2043 Floor Sanders and Finishers

Scrape and sand wooden floors to smooth surfaces using floor scraper and floor sanding machine, and apply coats of finish.

#### 47-2044 Tile and Marble Setters

Apply hard tile, marble, and wood tile to walls, floors, ceilings, and roof decks.

#### 47-2051 Cement Masons and Concrete Finishers

Smooth and finish surfaces of poured concrete, such as floors, walks, sidewalks, roads, or curbs using a variety of hand and power tools. Align forms for sidewalks, curbs, or gutters; patch voids; and use saws to cut expansion joints. Installers of mortarless segmental concrete masonry wall units are classified in "Landscaping and Groundskeeping Workers" (37-3011).

#### 47-2053 Terrazzo Workers and Finishers

Apply a mixture of cement, sand, pigment, or marble chips to floors, stairways, and cabinet fixtures to fashion durable and decorative surfaces.

#### 47-2061 Construction Laborers

Perform tasks involving physical labor at construction sites. May operate hand and power tools of all types: air hammers, earth tampers, cement mixers, small mechanical hoists, surveying and measuring equipment, and a variety of other equipment and instruments. May clean and prepare sites, dig trenches, set braces to support the sides of excavations, erect scaffolding, and clean up rubble, debris and other waste materials. May assist other craft workers. Construction laborers who primarily assist a particular craft worker are classified under "Helpers, Construction Trades" (47-3010). Excludes "Hazardous Materials Removal Workers" (47-4041).

#### 47-2071 Paving, Surfacing, and Tamping Equipment Operators

Operate equipment used for applying concrete, asphalt, or other materials to road beds, parking lots, or airport runways and taxiways, or equipment used for tamping gravel, dirt, or other materials. Includes concrete and asphalt paving machine operators, form tampers, tamping machine operators, and stone spreader operators.

#### 47-2072 Pile-Driver Operators

Operate pile drivers mounted on skids, barges, crawler treads, or locomotive cranes to drive pilings for retaining walls, bulkheads, and foundations of structures, such as buildings, bridges, and piers.

#### 47-2073 Operating Engineers and Other Construction Equipment Operators

Operate one or several types of power construction equipment, such as motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete or other hard surface pavement. May repair and maintain equipment in addition to other duties. Excludes "Crane and Tower Operators" (53-7021) and "Extraction Workers" (47-5000).

#### 47-2081 Drywall and Ceiling Tile Installers

Apply plasterboard or other wallboard to ceilings or interior walls of buildings. Apply or mount acoustical tiles or blocks, strips, or sheets of shock-absorbing materials to ceilings and walls of buildings to reduce or reflect sound. Materials may be of decorative quality. Includes lathers who fasten wooden, metal, or rockboard lath to walls, ceilings or partitions of buildings to provide support base for plaster, fire-proofing, or acoustical material. Excludes "Carpet Installers" (47-2041), "Carpenters" (47-2031), and "Tile and Marble Setters" (47-2044).

#### 47-2082 Tapers

Seal joints between plasterboard or other wallboard to prepare wall surface for painting or papering.

#### 47-2111 Electricians

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems. Excludes "Security and Fire Alarm Systems Installers" (49-2098).

#### 47-2121 Glaziers

Install glass in windows, skylights, store fronts, and display cases, or on surfaces, such as building fronts, interior walls, ceilings, and tabletops.

#### 47-2131 Insulation Workers, Floor, Ceiling, and Wall

Line and cover structures with insulating materials. May work with batt, roll, or blown insulation materials.



**47-2132 Insulation Workers, Mechanical**

Apply insulating materials to pipes or ductwork, or other mechanical systems in order to help control and maintain temperature.

**47-2141 Painters, Construction and Maintenance**

Paint walls, equipment, buildings, bridges, and other structural surfaces, using brushes, rollers, and spray guns. May remove old paint to prepare surface prior to painting. May mix colors or oils to obtain desired color or consistency. Excludes "Paperhangers" (47-2142).

**47-2142 Paperhangers**

Cover interior walls or ceilings of rooms with decorative wallpaper or fabric, or attach advertising posters on surfaces such as walls and billboards. May remove old materials or prepare surfaces to be papered.

**47-2151 Pipelayers**

Lay pipe for storm or sanitation sewers, drains, and water mains. Perform any combination of the following tasks: grade trenches or culverts, position pipe, or seal joints. Excludes "Welders, Cutters, Solderers, and Brazers" (51-4121).

**47-2152 Plumbers, Pipefitters, and Steamfitters**

Assemble, install, alter, and repair pipelines or pipe systems that carry water, steam, air, or other liquids or gases. May install heating and cooling equipment and mechanical control systems. Includes sprinkler fitters.

**47-2161 Plasterers and Stucco Masons**

Apply interior or exterior plaster, cement, stucco, or similar materials. May also set ornamental plaster.

**47-2171 Reinforcing Iron and Rebar Workers**

Position and secure steel bars or mesh in concrete forms in order to reinforce concrete. Use a variety of fasteners, rod-bending machines, blowtorches, and hand tools. Includes rod busters.

**47-2181 Roofers**

Cover roofs of structures with shingles, slate, asphalt, aluminum, wood, or related materials. May spray roofs, sidings, and walls with material to bind, seal, insulate, or soundproof sections of structures.

**47-2211 Sheet Metal Workers**

Fabricate, assemble, install, and repair sheet metal products and equipment, such as ducts, control boxes, drainpipes, and furnace casings. Work may involve any of the following: setting up and operating fabricating machines to cut, bend, and straighten sheet metal;

shaping metal over anvils, blocks, or forms using hammer; operating soldering and welding equipment to join sheet metal parts; or inspecting, assembling, and smoothing seams and joints of burred surfaces. Includes sheet metal duct installers who install prefabricated sheet metal ducts used for heating, air conditioning, or other purposes.

#### 47-2221 Structural Iron and Steel Workers

Raise, place, and unite iron or steel girders, columns, and other structural members to form completed structures or structural frameworks. May erect metal storage tanks and assemble prefabricated metal buildings. Excludes "Reinforcing Iron and Rebar Workers" (47-2171).

#### 47-2231 Solar Photovoltaic Installers

Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics. May include measuring, cutting, assembling, and bolting structural framing and solar modules. May perform minor electrical work such as current checks. Excludes solar thermal installers who are included in "Plumbers, Pipefitters, and Steamfitters" (47-2152). Excludes solar PV electricians who are included in "Electricians" (47-2111).

#### 47-3011 Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters

Help brickmasons, blockmasons, stonemasons, or tile and marble setters by performing duties requiring less skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist brickmasons, blockmasons, and stonemasons or tile and marble setters are classified under "Construction Laborers" (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).

#### 47-3012 Helpers—Carpenters

Help carpenters by performing duties requiring less skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist carpenters are classified under "Construction Laborers" (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).

#### 47-3013 Helpers—Electricians

Help electricians by performing duties requiring less skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist electricians are classified under "Construction Laborers" (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).

#### 47-3014 Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons

Help painters, paperhangers, plasterers, or stucco masons by performing duties requiring less skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist painters,

paperhangers, plasterers, or stucco masons are classified under "Construction Laborers" (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).

#### 47-3015 Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters

Help plumbers, pipefitters, steamfitters, or pipelayers by performing duties requiring less skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist plumbers, pipefitters, steamfitters, or pipelayers are classified under "Construction Laborers" (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).

#### 47-3016 Helpers—Roofers

Help roofers by performing duties requiring less skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist roofers are classified under "Construction Laborers" (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).

#### 47-3019 Helpers, Construction Trades, All Other

All construction trades helpers not listed separately.

#### 47-4011 Construction and Building Inspectors

Inspect structures using engineering skills to determine structural soundness and compliance with specifications, building codes, and other regulations. Inspections may be general in nature or may be limited to a specific area, such as electrical systems or plumbing.

#### 47-4021 Elevator Installers and Repairers

Assemble, install, repair, or maintain electric or hydraulic freight or passenger elevators, escalators, or dumbwaiters.

#### 47-4031 Fence Erectors

Erect and repair fences and fence gates, using hand and power tools.

#### 47-4041 Hazardous Materials Removal Workers

Identify, remove, pack, transport, or dispose of hazardous materials, including asbestos, lead-based paint, waste oil, fuel, transmission fluid, radioactive materials, or contaminated soil. Specialized training and certification in hazardous materials handling or a confined entry permit are generally required. May operate earth-moving equipment or trucks.

#### 47-4051 Highway Maintenance Workers

Maintain highways, municipal and rural roads, airport runways, and rights-of-way. Duties include patching broken or eroded pavement, repairing guard rails, highway markers, and

snow fences. May also mow or clear brush from along road or plow snow from roadway. Excludes "Tree Trimmers and Pruners" (37-3013).

#### 47-4061 Rail-Track Laying and Maintenance Equipment Operators

Lay, repair, and maintain track for standard or narrow-gauge railroad equipment used in regular railroad service or in plant yards, quarries, sand and gravel pits, and mines. Includes ballast cleaning machine operators and railroad bed tamping machine operators.

#### 47-4071 Septic Tank Servicers and Sewer Pipe Cleaners

Clean and repair septic tanks, sewer lines, or drains. May patch walls and partitions of tank, replace damaged drain tile, or repair breaks in underground piping.

#### 47-4091 Segmental Pavers

Lay out, cut, and place segmental paving units. Includes installers of bedding and restraining materials for the paving units.

#### 47-4099 Construction and Related Workers, All Other

All construction and related workers not listed separately.

#### 47-5011 Derrick Operators, Oil and Gas

Rig derrick equipment and operate pumps to circulate mud through drill hole.

#### 47-5012 Rotary Drill Operators, Oil and Gas

Set up or operate a variety of drills to remove underground oil and gas, or remove core samples for testing during oil and gas exploration. Excludes "Earth Drillers, Except Oil and Gas" (47-5021).

#### 47-5013 Service Unit Operators, Oil, Gas, and Mining

Operate equipment to increase oil flow from producing wells or to remove stuck pipe, casing, tools, or other obstructions from drilling wells. May also perform similar services in mining exploration operations. Includes fishing-tool technicians.

#### 47-5021 Earth Drillers, Except Oil and Gas

Operate a variety of drills such as rotary, churn, and pneumatic to tap sub-surface water and salt deposits, to remove core samples during mineral exploration or soil testing, and to facilitate the use of explosives in mining or construction. May use explosives. Includes horizontal and earth boring machine operators.

#### 47-5031 Explosives Workers, Ordnance Handling Experts, and Blasters

Place and detonate explosives to demolish structures or to loosen, remove, or displace earth, rock, or other materials. May perform specialized handling, storage, and accounting

procedures. Includes seismograph shooters. Excludes "Earth Drillers, Except Oil and Gas" (47-5021) who may also work with explosives.

#### 47-5041 Continuous Mining Machine Operators

Operate self-propelled mining machines that rip coal, metal and nonmetal ores, rock, stone, or sand from the mine face and load it onto conveyors or into shuttle cars in a continuous operation.

#### 47-5042 Mine Cutting and Channeling Machine Operators

Operate machinery such as longwall shears, plows, and cutting machines to cut or channel along the face or seams of coal mines, stone quarries, or other mining surfaces to facilitate blasting, separating, or removing minerals or materials from mines or from the Earth's surface. Includes shale planers.

#### 47-5049 Mining Machine Operators, All Other

All mining machine operators not listed separately.

#### 47-5051 Rock Splitters, Quarry

Separate blocks of rough dimension stone from quarry mass using jackhammer and wedges.

#### 47-5061 Roof Bolters, Mining

Operate machinery to install roof support bolts in underground mine.

#### 47-5071 Roustabouts, Oil and Gas

Assemble or repair oil field equipment using hand and power tools. Perform other tasks as needed.

#### 47-5081 Helpers--Extraction Workers

Help extraction craft workers, such as earth drillers, blasters and explosives workers, derrick operators, and mining machine operators, by performing duties requiring less skill. Duties include supplying equipment or cleaning work area. Apprentice workers are classified with the appropriate skilled construction trade occupation (47-5011 through 47-5099).

#### 47-5099 Extraction Workers, All Other

All extraction workers not listed separately.

#### 49-1011 First-Line Supervisors of Mechanics, Installers, and Repairers

Directly supervise and coordinate the activities of mechanics, installers, and repairers. Excludes team or work leaders.

#### 49-2011 Computer, Automated Teller, and Office Machine Repairers

Repair, maintain, or install computers, word processing systems, automated teller machines, and electronic office machines, such as duplicating and fax machines.

#### 49-2022 Telecommunications Equipment Installers and Repairers, Except Line Installers

Install, set-up, rearrange, or remove switching, distribution, routing, and dialing equipment used in central offices or headends. Service or repair telephone, cable television, Internet, and other communications equipment on customers' property. May install communications equipment or communications wiring in buildings. Excludes "Telecommunications Line Installers and Repairers" (49-9052).

#### 49-2091 Avionics Technicians

Install, inspect, test, adjust, or repair avionics equipment, such as radar, radio, navigation, and missile control systems in aircraft or space vehicles.

#### 49-2092 Electric Motor, Power Tool, and Related Repairers

Repair, maintain, or install electric motors, wiring, or switches.

#### 49-2093 Electrical and Electronics Installers and Repairers, Transportation Equipment

Install, adjust, or maintain mobile electronics communication equipment, including sound, sonar, security, navigation, and surveillance systems on trains, watercraft, or other mobile equipment. Excludes "Avionics Technicians" (49-2091) and "Electronic Equipment Installers and Repairers, Motor Vehicles" (49-2096).

#### 49-2094 Electrical and Electronics Repairers, Commercial and Industrial Equipment

Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas. Excludes "Avionics Technicians" (49-2091), "Electronic Equipment Installers and Repairers, Motor Vehicles" (49-2096), and "Electrical and Electronics Installers and Repairers, Transportation Equipment" (49-2093).

#### 49-2095 Electrical and Electronics Repairers, Powerhouse, Substation, and Relay

Inspect, test, repair, or maintain electrical equipment in generating stations, substations, and in-service relays.

#### 49-2096 Electronic Equipment Installers and Repairers, Motor Vehicles

Install, diagnose, or repair communications, sound, security, or navigation equipment in motor vehicles.

#### 49-2097 Electronic Home Entertainment Equipment Installers and Repairers

Repair, adjust, or install audio or television receivers, stereo systems, camcorders, video systems, or other electronic home entertainment equipment.

**49-2098 Security and Fire Alarm Systems Installers**

Install, program, maintain, and repair security and fire alarm wiring and equipment. Ensure that work is in accordance with relevant codes. Excludes "Electricians" (47-2111) who do a broad range of electrical wiring.

**49-3011 Aircraft Mechanics and Service Technicians**

Diagnose, adjust, repair, or overhaul aircraft engines and assemblies, such as hydraulic and pneumatic systems. Includes helicopter and aircraft engine specialists. Excludes "Avionics Technician" (49-2091).

**49-3021 Automotive Body and Related Repairers**

Repair and refinish automotive vehicle bodies and straighten vehicle frames. Excludes "Painters, Transportation Equipment" (51-9122) and "Automotive Glass Installers and Repairers" (49-3022).

**49-3022 Automotive Glass Installers and Repairers**

Replace or repair broken windshields and window glass in motor vehicles.

**49-3023 Automotive Service Technicians and Mechanics**

Diagnose, adjust, repair, or overhaul automotive vehicles. Excludes "Automotive Body and Related Repairers" (49-3021), "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031), and "Electronic Equipment Installers and Repairers, Motor Vehicles" (49-2096).

**49-3031 Bus and Truck Mechanics and Diesel Engine Specialists**

Diagnose, adjust, repair, or overhaul buses and trucks, or maintain and repair any type of diesel engines. Includes mechanics working primarily with automobile or marine diesel engines.

**49-3041 Farm Equipment Mechanics and Service Technicians**

Diagnose, adjust, repair, or overhaul farm machinery and vehicles, such as tractors, harvesters, dairy equipment, and irrigation systems. Excludes "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031).

**49-3042 Mobile Heavy Equipment Mechanics, Except Engines**

Diagnose, adjust, repair, or overhaul mobile mechanical, hydraulic, and pneumatic equipment, such as cranes, bulldozers, graders, and conveyors, used in construction, logging, and surface mining. Excludes "Rail Car Repairers" (49-3043) and "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031).

**49-3043 Rail Car Repairers**

Diagnose, adjust, repair, or overhaul railroad rolling stock, mine cars, or mass transit rail cars. Excludes "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031).

#### 49-3051 Motorboat Mechanics and Service Technicians

Repair and adjust electrical and mechanical equipment of inboard or inboard-outboard boat engines. Excludes "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031).

#### 49-3052 Motorcycle Mechanics

Diagnose, adjust, repair, or overhaul motorcycles, scooters, mopeds, dirt bikes, or similar motorized vehicles.

#### 49-3053 Outdoor Power Equipment and Other Small Engine Mechanics

Diagnose, adjust, repair, or overhaul small engines used to power lawn mowers, chain saws, recreational sporting equipment and related equipment.

#### 49-3091 Bicycle Repairers

Repair and service bicycles.

#### 49-3092 Recreational Vehicle Service Technicians

Diagnose, inspect, adjust, repair, or overhaul recreational vehicles including travel trailers. May specialize in maintaining gas, electrical, hydraulic, plumbing, or chassis/towing systems as well as repairing generators, appliances, and interior components. Includes workers who perform customized van conversions. Excludes "Automotive Service Technicians and Mechanics" (49-3023) and "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031) who also work on recreation vehicles.

#### 49-3093 Tire Repairers and Changers

Repair and replace tires.

#### 49-9011 Mechanical Door Repairers

Install, service, or repair automatic door mechanisms and hydraulic doors. Includes garage door mechanics.

#### 49-9012 Control and Valve Installers and Repairers, Except Mechanical Door

Install, repair, and maintain mechanical regulating and controlling devices, such as electric meters, gas regulators, thermostats, safety and flow valves, and other mechanical governors.

#### 49-9021 Heating, Air Conditioning, and Refrigeration Mechanics and Installers

Install or repair heating, central air conditioning, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves.

#### 49-9031 Home Appliance Repairers

Repair, adjust, or install all types of electric or gas household appliances, such as refrigerators, washers, dryers, and ovens.



**49-9041 Industrial Machinery Mechanics**

Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems. Excludes "Millwrights" (49-9044), "Mobile Heavy Equipment Mechanics, Except Engines" (49-3042), and "Maintenance Workers, Machinery" (49-9043).

**49-9043 Maintenance Workers, Machinery**

Lubricate machinery, change parts, or perform other routine machinery maintenance. Excludes "Maintenance and Repair Workers, General" (49-9071).

**49-9044 Millwrights**

Install, dismantle, or move machinery and heavy equipment according to layout plans, blueprints, or other drawings.

**49-9045 Refractory Materials Repairers, Except Brickmasons**

Build or repair equipment such as furnaces, kilns, cupolas, boilers, converters, ladles, soaking pits and ovens, using refractory materials.

**49-9051 Electrical Power-Line Installers and Repairers**

Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers. Excludes "Electrical and Electronics Repairers, Powerhouse, Substation, and Relay" (49-2095).

**49-9052 Telecommunications Line Installers and Repairers**

Install and repair telecommunications cable, including fiber optics.

**49-9061 Camera and Photographic Equipment Repairers**

Repair and adjust cameras and photographic equipment, including commercial video and motion picture camera equipment.

**49-9062 Medical Equipment Repairers**

Test, adjust, or repair biomedical or electromedical equipment.

**49-9063 Musical Instrument Repairers and Tuners**

Repair percussion, stringed, reed, or wind instruments. May specialize in one area, such as piano tuning. Excludes "Electronic Home Entertainment Equipment Installers and Repairers" (49-2097) who repair electrical and electronic musical instruments.

**49-9064 Watch Repairers**

Repair, clean, and adjust mechanisms of timing instruments, such as watches and clocks. Includes watchmakers, watch technicians, and mechanical timepiece repairers.

49-9069 Precision Instrument and Equipment Repairers, All Other

All precision instrument and equipment repairers not listed separately.

49-9071 Maintenance and Repair Workers, General

Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs. Excludes "Maintenance Workers, Machinery" (49-9043).

49-9081 Wind Turbine Service Technicians

Inspect, diagnose, adjust, or repair wind turbines. Perform maintenance on wind turbine equipment including resolving electrical, mechanical, and hydraulic malfunctions.

49-9091 Coin, Vending, and Amusement Machine Servicers and Repairers

Install, service, adjust, or repair coin, vending, or amusement machines including video games, juke boxes, pinball machines, or slot machines.

49-9092 Commercial Divers

Work below surface of water, using scuba gear to inspect, repair, remove, or install equipment and structures. May use a variety of power and hand tools, such as drills, sledgehammers, torches, and welding equipment. May conduct tests or experiments, rig explosives, or photograph structures or marine life. Excludes "Fishers and Related Fishing Workers" (45-3011), "Athletes and Sports Competitors" (27-2021), and "Police and Sheriff's Patrol Officers" (33-3051).

49-9093 Fabric Menders, Except Garment

Repair tears, holes, and other defects in fabrics, such as draperies, linens, parachutes, and tents.

49-9094 Locksmiths and Safe Repairers

Repair and open locks; make keys; change locks and safe combinations; and install and repair safes.

49-9095 Manufactured Building and Mobile Home Installers

Move or install mobile homes or prefabricated buildings.

49-9096 Riggers

Set up or repair rigging for construction projects, manufacturing plants, logging yards, ships and shipyards, or for the entertainment industry.

#### 49-9097 Signal and Track Switch Repairers

Install, inspect, test, maintain, or repair electric gate crossings, signals, signal equipment, track switches, section lines, or intercommunications systems within a railroad system.

#### 49-9098 Helpers--Installation, Maintenance, and Repair Workers

Help installation, maintenance, and repair workers in maintenance, parts replacement, and repair of vehicles, industrial machinery, and electrical and electronic equipment. Perform duties such as furnishing tools, materials, and supplies to other workers; cleaning work area, machines, and tools; and holding materials or tools for other workers.

#### 49-9099 Installation, Maintenance, and Repair Workers, All Other

All installation, maintenance, and repair workers not listed separately.

#### 51-1011 First-Line Supervisors of Production and Operating Workers

Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators. Excludes team or work leaders.

#### 51-2011 Aircraft Structure, Surfaces, Rigging, and Systems Assemblers

Assemble, fit, fasten, and install parts of airplanes, space vehicles, or missiles, such as tails, wings, fuselage, bulkheads, stabilizers, landing gear, rigging and control equipment, or heating and ventilating systems.

#### 51-2021 Coil Winders, Tapers, and Finishers

Wind wire coils used in electrical components, such as resistors and transformers, and in electrical equipment and instruments, such as field cores, bobbins, armature cores, electrical motors, generators, and control equipment.

#### 51-2022 Electrical and Electronic Equipment Assemblers

Assemble or modify electrical or electronic equipment, such as computers, test equipment telemetering systems, electric motors, and batteries.

#### 51-2023 Electromechanical Equipment Assemblers

Assemble or modify electromechanical equipment or devices, such as servomechanisms, gyros, dynamometers, magnetic drums, tape drives, brakes, control linkage, actuators, and appliances.

#### 51-2031 Engine and Other Machine Assemblers

Construct, assemble, or rebuild machines, such as engines, turbines, and similar equipment used in such industries as construction, extraction, textiles, and paper manufacturing.

**51-2041 Structural Metal Fabricators and Fitters**

Fabricate, lay out, position, align, and fit parts of structural metal products.

**51-2091 Fiberglass Laminators and Fabricators**

Laminate layers of fiberglass on molds to form boat decks and hulls, bodies for golf carts, automobiles, or other products.

**51-2092 Team Assemblers**

Work as part of a team having responsibility for assembling an entire product or component of a product. Team assemblers can perform all tasks conducted by the team in the assembly process and rotate through all or most of them rather than being assigned to a specific task on a permanent basis. May participate in making management decisions affecting the work. Includes team leaders who work as part of the team. Assemblers who continuously perform the same task are classified elsewhere in 51-2000.

**51-2093 Timing Device Assemblers and Adjusters**

Perform precision assembling, adjusting, or calibrating, within narrow tolerances, of timing devices such as digital clocks or timing devices with electrical or electronic components. Excludes watchmakers, which are included in "Watch Repairers" (49-9064).

**51-2099 Assemblers and Fabricators, All Other**

All assemblers and fabricators not listed separately.

**51-3011 Bakers**

Mix and bake ingredients to produce breads, rolls, cookies, cakes, pies, pastries, or other baked goods. Pastry chefs in restaurants and hotels are included with "Chefs and Head Cooks" (35-1011).

**51-3021 Butchers and Meat Cutters**

Cut, trim, or prepare consumer-sized portions of meat for use or sale in retail establishments.

**51-3022 Meat, Poultry, and Fish Cutters and Trimmers**

Use hand or hand tools to perform routine cutting and trimming of meat, poultry, and seafood.

**51-3023 Slaughterers and Meat Packers**

Work in slaughtering, meat packing, or wholesale establishments performing precision functions involving the preparation of meat. Work may include specialized slaughtering tasks, cutting standard or premium cuts of meat for marketing, making sausage, or wrapping meats. Excludes "Meat, Poultry, and Fish Cutters and Trimmers" (51-3022) who perform routine meat cutting.

**51-3091 Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders**

Operate or tend food or tobacco roasting, baking, or drying equipment, including hearth ovens, kiln driers, roasters, char kilns, and vacuum drying equipment.

**51-3092 Food Batchmakers**

Set up and operate equipment that mixes or blends ingredients used in the manufacturing of food products. Includes candy makers and cheese makers.

**51-3093 Food Cooking Machine Operators and Tenders**

Operate or tend cooking equipment, such as steam cooking vats, deep fry cookers, pressure cookers, kettles, and boilers, to prepare food products. Excludes "Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders" (51-3091).

**51-3099 Food Processing Workers, All Other**

All food processing workers not listed separately

**51-4011 Computer-Controlled Machine Tool Operators, Metal and Plastic**

Operate computer-controlled machines or robots to perform one or more machine functions on metal or plastic work pieces.

**51-4012 Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic**

Develop programs to control machining or processing of metal or plastic parts by automatic machine tools, equipment, or systems.

**51-4021 Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend machines to extrude or draw thermoplastic or metal materials into tubes, rods, hoses, wire, bars, or structural shapes.

**51-4022 Forging Machine Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend forging machines to taper, shape, or form metal or plastic parts.

**51-4023 Rolling Machine Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend machines to roll steel or plastic forming bends, beads, knurls, rolls, or plate or to flatten, temper, or reduce gauge of material.

**51-4031 Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend machines to saw, cut, shear, slit, punch, crimp, notch, bend, or straighten metal or plastic material.

**51-4032 Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend drilling machines to drill, bore, ream, mill, or countersink metal or plastic work pieces.

51-4033 Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend grinding and related tools that remove excess material or burrs from surfaces, sharpen edges or corners, or buff, hone, or polish metal or plastic work pieces.

51-4034 Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend lathe and turning machines to turn, bore, thread, form, or face metal or plastic materials, such as wire, rod, or bar stock.

51-4035 Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend milling or planing machines to mill, plane, shape, groove, or profile metal or plastic work pieces.

51-4041 Machinists

Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, mathematics, metal properties, layout, and machining procedures.

51-4051 Metal-Refining Furnace Operators and Tenders

Operate or tend furnaces, such as gas, oil, coal, electric-arc or electric induction, open-hearth, or oxygen furnaces, to melt and refine metal before casting or to produce specified types of steel. Excludes "Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic" (51-4191).

51-4052 Pourers and Casters, Metal

Operate hand-controlled mechanisms to pour and regulate the flow of molten metal into molds to produce castings or ingots.

51-4061 Model Makers, Metal and Plastic

Set up and operate machines, such as lathes, milling and engraving machines, and jig borers to make working models of metal or plastic objects. Includes template makers.

51-4062 Patternmakers, Metal and Plastic

Lay out, machine, fit, and assemble castings and parts to metal or plastic foundry patterns, core boxes, or match plates.

**51-4071 Foundry Mold and Coremakers**

Make or form wax or sand cores or molds used in the production of metal castings in foundries.

**51-4072 Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend metal or plastic molding, casting, or coremaking machines to mold or cast metal or thermoplastic parts or products.

**51-4081 Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend more than one type of cutting or forming machine tool or robot.

**51-4111 Tool and Die Makers**

Analyze specifications, lay out metal stock, set up and operate machine tools, and fit and assemble parts to make and repair dies, cutting tools, jigs, fixtures, gauges, and machinists' hand tools.

**51-4121 Welders, Cutters, Solderers, and Brazers**

Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.

**51-4122 Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders**

Set up, operate, or tend welding, soldering, or brazing machines or robots that weld, braze, solder, or heat treat metal products, components, or assemblies. Includes workers who operate laser cutters or laser-beam machines.

**51-4191 Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend heating equipment, such as heat-treating furnaces, flame-hardening machines, induction machines, soaking pits, or vacuum equipment to temper, harden, anneal, or heat-treat metal or plastic objects.

**51-4192 Layout Workers, Metal and Plastic**

Lay out reference points and dimensions on metal or plastic stock or workpieces, such as sheets, plates, tubes, structural shapes, castings, or machine parts, for further processing. Includes shipfitters.

**51-4193 Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic**

Set up, operate, or tend plating or coating machines to coat metal or plastic products with chromium, zinc, copper, cadmium, nickel, or other metal to protect or decorate surfaces. Includes electrolytic processes.

**51-4194 Tool Grinders, Filers, and Sharpeners**

Perform precision smoothing, sharpening, polishing, or grinding of metal objects.

**51-4199 Metal Workers and Plastic Workers, All Other**

All metal workers and plastic workers not listed separately.

**51-5111 Prepress Technician and Workers**

Format and proof text and images submitted by designers and clients into finished pages that can be printed. Includes digital and photo typesetting. May produce printing plates.

**51-5112 Printing Press Operators**

Set up and operate digital, letterpress, lithographic, flexographic, gravure, or other printing machines. Includes short-run offset printing presses.

**51-5113 Print Binding and Finishing Workers**

Bind books and other publications or finish printed products by hand or machine. May set up binding and finishing machines.

**51-6011 Laundry and Dry-Cleaning Workers**

Operate or tend washing or dry-cleaning machines to wash or dry-clean industrial or household articles, such as cloth garments, suede, leather, furs, blankets, draperies, linens, rugs, and carpets. Includes spotters and dyers of these articles.

**51-6021 Pressers, Textile, Garment, and Related Materials**

Press or shape articles by hand or machine.

**51-6031 Sewing Machine Operators**

Operate or tend sewing machines to join, reinforce, decorate, or perform related sewing operations in the manufacture of garment or nongarment products.

**51-6041 Shoe and Leather Workers and Repairers**

Construct, decorate, or repair leather and leather-like products, such as luggage, shoes, and saddles.

**51-6042 Shoe Machine Operators and Tenders**

Operate or tend a variety of machines to join, decorate, reinforce, or finish shoes and shoe parts.

**51-6051 Sewers, Hand**

Sew, join, reinforce, or finish, usually with needle and thread, a variety of manufactured items. Includes weavers and stitchers. Excludes "Fabric Menders, Except Garment" (49-9093).



**51-6052 Tailors, Dressmakers, and Custom Sewers**

Design, make, alter, repair, or fit garments.

**51-6061 Textile Bleaching and Dyeing Machine Operators and Tenders**

Operate or tend machines to bleach, shrink, wash, dye, or finish textiles or synthetic or glass fibers.

**51-6062 Textile Cutting Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines that cut textiles.

**51-6063 Textile Knitting and Weaving Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines that knit, loop, weave, or draw in textiles. Excludes "Sewing Machine Operators" (51-6031).

**51-6064 Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines that wind or twist textiles; or draw out and combine sliver, such as wool, hemp, or synthetic fibers. Includes slubber machine and drawing frame operators.

**51-6091 Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers**

Set up, operate, or tend machines that extrude and form continuous filaments from synthetic materials, such as liquid polymer, rayon, and fiberglass.

**51-6092 Fabric and Apparel Patternmakers**

Draw and construct sets of precision master fabric patterns or layouts. May also mark and cut fabrics and apparel.

**51-6093 Upholsterers**

Make, repair, or replace upholstery for household furniture or transportation vehicles.

**51-6099 Textile, Apparel, and Furnishings Workers, All Other**

All textile, apparel, and furnishings workers not listed separately.

**51-7011 Cabinetmakers and Bench Carpenters**

Cut, shape, and assemble wooden articles or set up and operate a variety of woodworking machines, such as power saws, jointers, and mortisers to surface, cut, or shape lumber or to fabricate parts for wood products. Excludes "Woodworking Machine Setters, Operators, and Tenders" (51-7040).

**51-7021 Furniture Finishers**

Shape, finish, and refinish damaged, worn, or used furniture or new high-grade furniture to specified color or finish.

**51-7031 Model Makers, Wood**

Construct full-size and scale wooden precision models of products. Includes wood jig builders and loft workers.

**51-7032 Patternmakers, Wood**

Plan, lay out, and construct wooden unit or sectional patterns used in forming sand molds for castings.

**51-7041 Sawing Machine Setters, Operators, and Tenders, Wood**

Set up, operate, or tend wood sawing machines. May operate CNC equipment. Includes lead sawyers.

**51-7042 Woodworking Machine Setters, Operators, and Tenders, Except Sawing**

Set up, operate, or tend woodworking machines, such as drill presses, lathes, shapers, routers, sanders, planers, and wood nailing machines. May operate CNC equipment.

**51-7099 Woodworkers, All Other**

All woodworkers not listed separately.

**51-8011 Nuclear Power Reactor Operators**

Operate or control nuclear reactors. Move control rods, start and stop equipment, monitor and adjust controls, and record data in logs. Implement emergency procedures when needed. May respond to abnormalities, determine cause, and recommend corrective action.

**51-8012 Power Distributors and Dispatchers**

Coordinate, regulate, or distribute electricity or steam.

**51-8013 Power Plant Operators**

Control, operate, or maintain machinery to generate electric power. Includes auxiliary equipment operators. Excludes "Nuclear Power Reactor Operators" (51-8011).

**51-8021 Stationary Engineers and Boiler Operators**

Operate or maintain stationary engines, boilers, or other mechanical equipment to provide utilities for buildings or industrial processes. Operate equipment, such as steam engines, generators, motors, turbines, and steam boilers.

**51-8031 Water and Wastewater Treatment Plant and System Operators**

Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or wastewater.

**51-8091 Chemical Plant and System Operators**

Control or operate entire chemical processes or system of machines.

**51-8092 Gas Plant Operators**

Distribute or process gas for utility companies and others by controlling compressors to maintain specified pressures on main pipelines.

**51-8093 Petroleum Pump System Operators, Refinery Operators, and Gaugers**

Operate or control petroleum refining or processing units. May specialize in controlling manifold and pumping systems, gauging or testing oil in storage tanks, or regulating the flow of oil into pipelines.

**51-8099 Plant and System Operators, All Other**

All plant and system operators not listed separately.

**51-9011 Chemical Equipment Operators and Tenders**

Operate or tend equipment to control chemical changes or reactions in the processing of industrial or consumer products. Equipment used includes devulcanizers, steam-jacketed kettles, and reactor vessels. Excludes "Chemical Plant and System Operators" (51-8091).

**51-9012 Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders**

Set up, operate, or tend continuous flow or vat-type equipment; filter presses; shaker screens; centrifuges; condenser tubes; precipitating, fermenting, or evaporating tanks; scrubbing towers; or batch stills. These machines extract, sort, or separate liquids, gases, or solids from other materials to recover a refined product. Includes dairy processing equipment operators. Excludes "Chemical Equipment Operators and Tenders" (51-9011).

**51-9021 Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines to crush, grind, or polish materials, such as coal, glass, grain, stone, food, or rubber.

**51-9022 Grinding and Polishing Workers, Hand**

Grind, sand, or polish, using hand tools or hand-held power tools, a variety of metal, wood, stone, clay, plastic, or glass objects. Includes chippers, buffers, and finishers.

**51-9023 Mixing and Blending Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines to mix or blend materials, such as chemicals, tobacco, liquids, color pigments, or explosive ingredients. Excludes "Food Batchmakers" (51-3092).

**51-9031 Cutters and Trimmers, Hand**

Use hand tools or hand-held power tools to cut and trim a variety of manufactured items, such as carpet, fabric, stone, glass, or rubber.

**51-9032 Cutting and Slicing Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines that cut or slice materials, such as glass, stone, cork, rubber, tobacco, food, paper, or insulating material. Excludes "Woodworking Machine Setters, Operators, and Tenders" (51-7040), "Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic" (51-4031), and "Textile Cutting Machine Setters, Operators, and Tenders" (51-6062).

**51-9041 Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines, such as glass forming machines, plodder machines, and tuber machines, to shape and form products, such as glassware, food, rubber, soap, brick, tile, clay, wax, tobacco, or cosmetics. Excludes "Paper Goods Machine Setters, Operators, and Tenders" (51-9196) and "Shoe Machine Operators and Tenders" (51-6042).

**51-9051 Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders**

Operate or tend heating equipment other than basic metal, plastic, or food processing equipment. Includes activities, such as annealing glass, drying lumber, curing rubber, removing moisture from materials, or boiling soap.

**51-9061 Inspectors, Testers, Sorters, Samplers, and Weighers**

Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.

**51-9071 Jewelers and Precious Stone and Metal Workers**

Design, fabricate, adjust, repair, or appraise jewelry, gold, silver, other precious metals, or gems. Includes diamond polishers and gem cutters, and persons who perform precision casting and modeling of molds, casting metal in molds, or setting precious and semi-precious stones for jewelry and related products.

**51-9081 Dental Laboratory Technicians**

Construct and repair full or partial dentures or dental appliances. Excludes "Dental Assistants" (31-9091).

**51-9082 Medical Appliance Technicians**

Construct, fit, maintain, or repair medical supportive devices, such as braces, orthotics and prosthetic devices, joints, arch supports, and other surgical and medical appliances.

**51-9083 Ophthalmic Laboratory Technicians**

Cut, grind, and polish eyeglasses, contact lenses, or other precision optical elements. Assemble and mount lenses into frames or process other optical elements. Includes precision lens polishers or grinders, centerer-edgers, and lens mounters. Excludes "Opticians, Dispensing" (29-2081).

**51-9111 Packaging and Filling Machine Operators and Tenders**

Operate or tend machines to prepare industrial or consumer products for storage or shipment. Includes cannery workers who pack food products.

**51-9121 Coating, Painting, and Spraying Machine Setters, Operators, and Tenders**

Set up, operate, or tend machines to coat or paint any of a wide variety of products including, glassware, cloth, ceramics, metal, plastic, paper, or wood, with lacquer, silver, copper, rubber, varnish, glaze, enamel, oil, or rust-proofing materials. Excludes "Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic" (51-4193) and "Painters, Transportation Equipment" (51-9122).

**51-9122 Painters, Transportation Equipment**

Operate or tend painting machines to paint surfaces of transportation equipment, such as automobiles, buses, trucks, trains, boats, and airplanes. Includes painters in auto body repair facilities.

**51-9123 Painting, Coating, and Decorating Workers**

Paint, coat, or decorate articles, such as furniture, glass, plateware, pottery, jewelry, toys, books, or leather. Excludes "Artists and Related Workers" (27-1010), "Designers" (27-1020), "Photographic Process Workers and Processing Machine Operators" (51-9151), and "Etchers and Engravers" (51-9194).

**51-9141 Semiconductor Processors**

Perform any or all of the following functions in the manufacture of electronic semiconductors: load semiconductor material into furnace; saw formed ingots into segments; load individual segment into crystal growing chamber and monitor controls; locate crystal axis in ingot using x-ray equipment and saw ingots into wafers; and clean, polish, and load wafers into series of special purpose furnaces, chemical baths, and equipment used to form circuitry and change conductive properties.

**51-9151 Photographic Process Workers and Processing Machine Operators**

Perform work involved in developing and processing photographic images from film or digital media. May perform precision tasks such as editing photographic negatives and prints.

**51-9191 Adhesive Bonding Machine Operators and Tenders**

Operate or tend bonding machines that use adhesives to join items for further processing or to form a completed product. Processes include joining veneer sheets into plywood; gluing paper; or joining rubber and rubberized fabric parts, plastic, simulated leather, or other materials. Excludes "Shoe Machine Operators and Tenders" (51-6042).

**51-9192 Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders**

Operate or tend machines to wash or clean products, such as barrels or kegs, glass items, tin plate, food, pulp, coal, plastic, or rubber, to remove impurities.

**51-9193 Cooling and Freezing Equipment Operators and Tenders**

Operate or tend equipment, such as cooling and freezing units, refrigerators, batch freezers, and freezing tunnels, to cool or freeze products, food, blood plasma, and chemicals.

**51-9194 Etchers and Engravers**

Engrave or etch metal, wood, rubber, or other materials. Includes such workers as etcher-circuit processors, pantograph engravers, and silk screen etchers. Photoengravers are included in "Prepress Technicians and Workers" (51-5111).

**51-9195 Molders, Shapers, and Casters, Except Metal and Plastic**

Mold, shape, form, cast, or carve products such as food products, figurines, tile, pipes, and candles consisting of clay, glass, plaster, concrete, stone, or combinations of materials.

**51-9196 Paper Goods Machine Setters, Operators, and Tenders**

Set up, operate, or tend paper goods machines that perform a variety of functions, such as converting, sawing, corrugating, banding, wrapping, boxing, stitching, forming, or sealing paper or paperboard sheets into products.

**51-9197 Tire Builders**

Operate machines to build tires.

**51-9198 Helpers--Production Workers**

Help production workers by performing duties requiring less skill. Duties include supplying or holding materials or tools, and cleaning work area and equipment. Apprentice workers are classified in the appropriate production occupations (51-0000).

#### 51-9199 Production Workers, All Other

All production workers not listed separately.

#### 53-1011 Aircraft Cargo Handling Supervisors

Supervise and coordinate the activities of ground crew in the loading, unloading, securing, and staging of aircraft cargo or baggage. May determine the quantity and orientation of cargo and compute aircraft center of gravity. May accompany aircraft as member of flight crew and monitor and handle cargo in flight, and assist and brief passengers on safety and emergency procedures. Includes loadmasters.

#### 53-1021 First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand

Directly supervise and coordinate the activities of helpers, laborers, or material movers.

#### 53-1031 First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators

Directly supervise and coordinate activities of transportation and material-moving machine and vehicle operators and helpers.

#### 53-2011 Airline Pilots, Copilots, and Flight Engineers

Pilot and navigate the flight of fixed-wing, multi-engine aircraft, usually on scheduled air carrier routes, for the transport of passengers and cargo. Requires Federal Air Transport certificate and rating for specific aircraft type used. Includes regional, National, and international airline pilots and flight instructors of airline pilots.

#### 53-2012 Commercial Pilots

Pilot and navigate the flight of fixed-wing aircraft on nonscheduled air carrier routes, or helicopters. Requires Commercial Pilot certificate. Includes charter pilots with similar certification, and air ambulance and air tour pilots. Excludes regional, National, and international airline pilots.

#### 53-2021 Air Traffic Controllers

Control air traffic on and within vicinity of airport and movement of air traffic between altitude sectors and control centers according to established procedures and policies. Authorize, regulate, and control commercial airline flights according to government or company regulations to expedite and ensure flight safety.

#### 53-2022 Airfield Operations Specialists

Ensure the safe takeoff and landing of commercial and military aircraft. Duties include coordination between air-traffic control and maintenance personnel; dispatching; using airfield landing and navigational aids; implementing airfield safety procedures; monitoring and maintaining flight records; and applying knowledge of weather information.

**53-2031 Flight Attendants**

Provide personal services to ensure the safety, security, and comfort of airline passengers during flight. Greet passengers, verify tickets, explain use of safety equipment, and serve food or beverages.

**53-3011 Ambulance Drivers and Attendants, Except Emergency Medical Technicians**

Drive ambulance or assist ambulance driver in transporting sick, injured, or convalescent persons. Assist in lifting patients.

**53-3021 Bus Drivers, Transit and Intercity**

Drive bus or motor coach, including regular route operations, charters, and private carriage. May assist passengers with baggage. May collect fares or tickets.

**53-3022 Bus Drivers, School or Special Client**

Transport students or special clients, such as the elderly or persons with disabilities. Ensure adherence to safety rules. May assist passengers in boarding or exiting.

**53-3031 Driver/Sales Workers**

Drive truck or other vehicle over established routes or within an established territory and sell or deliver goods, such as food products, including restaurant take-out items, or pick up or deliver items such as commercial laundry. May also take orders, collect payment, or stock merchandise at point of delivery. Includes newspaper delivery drivers. Excludes "Coin, Vending, and Amusement Machine Servicers and Repairers" (49-9091) and "Light Truck or Delivery Services Drivers" (53-3033).

**53-3032 Heavy and Tractor-Trailer Truck Drivers**

Drive a tractor-trailer combination or a truck with a capacity of at least 26,000 pounds Gross Vehicle Weight (GVW). May be required to unload truck. Requires commercial drivers' license.

**53-3033 Light Truck or Delivery Services Drivers**

Drive a light vehicle, such as a truck or van, with a capacity of less than 26,000 pounds Gross Vehicle Weight (GVW), primarily to deliver or pick up merchandise or to deliver packages. May load and unload vehicle. Excludes "Couriers and Messengers" (43-5021) and "Driver/Sales Workers" (53-3031).

**53-3041 Taxi Drivers and Chauffeurs**

Drive automobiles, vans, or limousines to transport passengers. May occasionally carry cargo. Includes hearse drivers. Excludes "Ambulance Drivers and Attendants, Except Emergency Medical Technicians" (53-3011) and "Bus Drivers" (53-3020).



**53-3099 Motor Vehicle Operators, All Other**

All motor vehicle operators not listed separately.

**53-4011 Locomotive Engineers**

Drive electric, diesel-electric, steam, or gas-turbine-electric locomotives to transport passengers or freight. Interpret train orders, electronic or manual signals, and railroad rules and regulations.

**53-4012 Locomotive Firers**

Monitor locomotive instruments and watch for dragging equipment, obstacles on rights-of-way, and train signals during run. Watch for and relay traffic signals from yard workers to yard engineer in railroad yard.

**53-4013 Rail Yard Engineers, Dinkey Operators, and Hostlers**

Drive switching or other locomotive or dinkey engines within railroad yard, industrial plant, quarry, construction project, or similar location.

**53-4021 Railroad Brake, Signal, and Switch Operators**

Operate railroad track switches. Couple or uncouple rolling stock to make up or break up trains. Signal engineers by hand or flagging. May inspect couplings, air hoses, journal boxes, and hand brakes.

**53-4031 Railroad Conductors and Yardmasters**

Coordinate activities of switch-engine crew within railroad yard, industrial plant, or similar location. Conductors coordinate activities of train crew on passenger or freight trains. Yardmasters review train schedules and switching orders and coordinate activities of workers engaged in railroad traffic operations, such as the makeup or breakup of trains and yard switching.

**53-4041 Subway and Streetcar Operators**

Operate subway or elevated suburban trains with no separate locomotive, or electric-powered streetcar, to transport passengers. May handle fares.

**53-4099 Rail Transportation Workers, All Other**

All rail transportation workers not listed separately.

**53-5011 Sailors and Marine Oilers**

Stand watch to look for obstructions in path of vessel, measure water depth, turn wheel on bridge, or use emergency equipment as directed by captain, mate, or pilot. Break out, rig, overhaul, and store cargo-handling gear, stationary rigging, and running gear. Perform a variety of maintenance tasks to preserve the painted surface of the ship and to maintain line

and ship equipment. Must hold government-issued certification and tankerman certification when working aboard liquid-carrying vessels. Includes able seamen and ordinary seamen.

#### 53-5021 Captains, Mates, and Pilots of Water Vessels

Command or supervise operations of ships and water vessels, such as tugboats and ferryboats. Required to hold license issued by U.S. Coast Guard. Excludes "Motorboat Operators" (53-5022).

#### 53-5022 Motorboat Operators

Operate small motor-driven boats. May assist in navigational activities.

#### 53-5031 Ship Engineers

Supervise and coordinate activities of crew engaged in operating and maintaining engines, boilers, deck machinery, and electrical, sanitary, and refrigeration equipment aboard ship.

#### 53-6011 Bridge and Lock Tenders

Operate and tend bridges, canal locks, and lighthouses to permit marine passage on inland waterways, near shores, and at danger points in waterway passages. May supervise such operations. Includes drawbridge operators, lock operators, and slip bridge operators.

#### 53-6021 Parking Lot Attendants

Park vehicles or issue tickets for customers in a parking lot or garage. May collect fee.

#### 53-6031 Automotive and Watercraft Service Attendants

Service automobiles, buses, trucks, boats, and other automotive or marine vehicles with fuel, lubricants, and accessories. Collect payment for services and supplies. May lubricate vehicle, change motor oil, install antifreeze, or replace lights or other accessories, such as windshield wiper blades or fan belts. May repair or replace tires.

#### 53-6041 Traffic Technicians

Conduct field studies to determine traffic volume, speed, effectiveness of signals, adequacy of lighting, and other factors influencing traffic conditions, under direction of traffic engineer.

#### 53-6051 Transportation Inspectors

Inspect equipment or goods in connection with the safe transport of cargo or people. Includes rail transportation inspectors, such as freight inspectors; rail inspectors; and other inspectors of transportation vehicles, not elsewhere classified. Excludes "Transportation Security Screeners" (33-9093).

#### 53-6061 Transportation Attendants, Except Flight Attendants

Provide services to ensure the safety and comfort of passengers aboard ships, buses, trains, or within the station or terminal. Perform duties such as greeting passengers, explaining the

use of safety equipment, serving meals or beverages, or answering questions related to travel. Excludes "Baggage Porters and Bellhops" (39-6011).

#### 53-6099 Transportation Workers, All Other

All transportation workers not listed separately.

#### 53-7011 Conveyor Operators and Tenders

Control or tend conveyors or conveyor systems that move materials or products to and from stockpiles, processing stations, departments, or vehicles. May control speed and routing of materials or products.

#### 53-7021 Crane and Tower Operators

Operate mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products in many directions. Excludes "Excavating and Loading Machine and Dragline Operators" (53-7032).

#### 53-7031 Dredge Operators

Operate dredge to remove sand, gravel, or other materials in order to excavate and maintain navigable channels in waterways.

#### 53-7032 Excavating and Loading Machine and Dragline Operators

Operate or tend machinery equipped with scoops, shovels, or buckets, to excavate and load loose materials. Excludes "Dredge Operators" (53-7031).

#### 53-7033 Loading Machine Operators, Underground Mining

Operate underground loading machine to load coal, ore, or rock into shuttle or mine car or onto conveyors. Loading equipment may include power shovels, hoisting engines equipped with cable-drawn scraper or scoop, or machines equipped with gathering arms and conveyor.

#### 53-7041 Hoist and Winch Operators

Operate or tend hoists or winches to lift and pull loads using power-operated cable equipment. Excludes "Crane and Tower Operators" (53-7021).

#### 53-7051 Industrial Truck and Tractor Operators

Operate industrial trucks or tractors equipped to move materials around a warehouse, storage yard, factory, construction site, or similar location. Excludes "Logging Equipment Operators" (45-4022).

#### 53-7061 Cleaners of Vehicles and Equipment

Wash or otherwise clean vehicles, machinery, and other equipment. Use such materials as water, cleaning agents, brushes, cloths, and hoses. Excludes "Janitors and Cleaners, Except Maids and Housekeeping Cleaners" (37-2011).

**53-7062 Laborers and Freight, Stock, and Material Movers, Hand**

Manually move freight, stock, or other materials or perform other general labor. Includes all manual laborers not elsewhere classified. Excludes "Material Moving Workers" (53-7011 through 53-7199) who use power equipment. Excludes "Construction Laborers" (47-2061) and "Construction Trades Helpers" (47-3011 through 47-3019).

**53-7063 Machine Feeders and Offbearers**

Feed materials into or remove materials from machines or equipment that is automatic or tended by other workers.

**53-7064 Packers and Packagers, Hand**

Pack or package by hand a wide variety of products and materials.

**53-7071 Gas Compressor and Gas Pumping Station Operators**

Operate steam, gas, electric motor, or internal combustion engine driven compressors. Transmit, compress, or recover gases, such as butane, nitrogen, hydrogen, and natural gas.

**53-7072 Pump Operators, Except Wellhead Pumpers**

Tend, control, or operate power-driven, stationary, or portable pumps and manifold systems to transfer gases, oil, other liquids, slurries, or powdered materials to and from various vessels and processes.

**53-7073 Wellhead Pumpers**

Operate power pumps and auxiliary equipment to produce flow of oil or gas from wells in oil field.

**53-7081 Refuse and Recyclable Material Collectors**

Collect and dump refuse or recyclable materials from containers into truck. May drive truck.

**53-7111 Mine Shuttle Car Operators**

Operate diesel or electric-powered shuttle car in underground mine to transport materials from working face to mine cars or conveyor.

**53-7121 Tank Car, Truck, and Ship Loaders**

Load and unload chemicals and bulk solids, such as coal, sand, and grain into or from tank cars, trucks, or ships using material moving equipment. May perform a variety of other tasks relating to shipment of products. May gauge or sample shipping tanks and test them for leaks.

**53-7199 Material Moving Workers, All Other**

All material moving workers not listed separately.

#### 55-1011 Air Crew Officers

Perform and direct in-flight duties to ensure the successful completion of combat, reconnaissance, transport, and search and rescue missions. Duties include operating aircraft communications and radar equipment, such as establishing satellite linkages and jamming enemy communications capabilities; operating aircraft weapons and defensive systems; conducting pre-flight, in-flight, and post-flight inspections of onboard equipment; and directing cargo and personnel drops.

#### 55-1012 Aircraft Launch and Recovery Officers

Plan and direct the operation and maintenance of catapults, arresting gear, and associated mechanical, hydraulic, and control systems involved primarily in aircraft carrier takeoff and landing operations. Duties include supervision of readiness and safety of arresting gear, launching equipment, barricades, and visual landing aid systems; planning and coordinating the design, development, and testing of launch and recovery systems; preparing specifications for catapult and arresting gear installations; evaluating design proposals; determining handling equipment needed for new aircraft; preparing technical data and instructions for operation of landing aids; and training personnel in carrier takeoff and landing procedures.

#### 55-1013 Armored Assault Vehicle Officers

Direct the operation of tanks, light armor, and amphibious assault vehicle units during combat situations on land or in aquatic environments. Duties include directing crew members in the operation of targeting and firing systems; coordinating the operation of advanced onboard communications and navigation equipment; directing the transport of personnel and equipment during combat; formulating and implementing battle plans, including the tactical employment of armored vehicle units; and coordinating with infantry, artillery, and air support units.

#### 55-1014 Artillery and Missile Officers

Manage personnel and weapons operations to destroy enemy positions, aircraft, and vessels. Duties include planning, targeting, and coordinating the tactical deployment of field artillery and air defense artillery missile systems units; directing the establishment and operation of fire control communications systems; targeting and launching intercontinental ballistic missiles; directing the storage and handling of nuclear munitions and components; overseeing security of weapons storage and launch facilities; and managing maintenance of weapons systems.

#### 55-1015 Command and Control Center Officers

Manage the operation of communications, detection, and weapons systems essential for controlling air, ground, and naval operations. Duties include managing critical communication links between air, naval, and ground forces; formulating and implementing emergency plans for natural and wartime disasters; coordinating emergency response teams and agencies; evaluating command center information and need for high-level military and government reporting; managing the operation of surveillance and detection systems;

providing technical information and advice on capabilities and operational readiness; and directing operation of weapons targeting, firing, and launch computer systems.

#### 55-1016 Infantry Officers

Direct, train, and lead infantry units in ground combat operations. Duties include directing deployment of infantry weapons, vehicles, and equipment; directing location, construction, and camouflage of infantry positions and equipment; managing field communications operations; coordinating with armor, artillery, and air support units; performing strategic and tactical planning, including battle plan development; and leading basic reconnaissance operations.

#### 55-1017 Special Forces Officers

Lead elite teams that implement unconventional operations by air, land, or sea during combat or peacetime. These activities include offensive raids, demolitions, reconnaissance, search and rescue, and counterterrorism. In addition to their combat training, special forces officers often have specialized training in swimming, diving, parachuting, survival, emergency medicine, and foreign languages. Duties include directing advanced reconnaissance operations and evaluating intelligence information; recruiting, training, and equipping friendly forces; leading raids and invasions on enemy territories; training personnel to implement individual missions and contingency plans; performing strategic and tactical planning for politically sensitive missions; and operating sophisticated communications equipment.

#### 55-1019 Military Officer Special and Tactical Operations Leaders, All Other

All military officer special and tactical operations leaders not listed separately.

#### 55-2011 First-Line Supervisors of Air Crew Members

Supervise and coordinate the activities of air crew members. Supervisors may also perform the same activities as the workers they supervise.

#### 55-2012 First-Line Supervisors of Weapons Specialists/Crew Members

Supervise and coordinate the activities of weapons specialists/crew members. Supervisors may also perform the same activities as the workers they supervise.

#### 55-2013 First-Line Supervisors of All Other Tactical Operations Specialists

Supervise and coordinate the activities of all other tactical operations specialists not classified separately above. Supervisors may also perform the same activities as the workers they supervise.

#### 55-3011 Air Crew Members

Perform in-flight duties to ensure the successful completion of combat, reconnaissance, transport, and search and rescue missions. Duties include operating aircraft communications and detection equipment, including establishing satellite linkages and jamming enemy

communications capabilities; conducting pre-flight, in-flight, and post-flight inspections of onboard equipment; operating and maintaining aircraft weapons and defensive systems; operating and maintaining aircraft in-flight refueling systems; executing aircraft safety and emergency procedures; computing and verifying passenger, cargo, fuel, and emergency and special equipment weight and balance data; and conducting cargo and personnel drops.

#### 55-3012 Aircraft Launch and Recovery Specialists

Operate and maintain catapults, arresting gear, and associated mechanical, hydraulic, and control systems involved primarily in aircraft carrier takeoff and landing operations. Duties include installing and maintaining visual landing aids; testing and maintaining launch and recovery equipment using electric and mechanical test equipment and hand tools; activating airfield arresting systems, such as crash barriers and cables, during emergency landing situations; directing aircraft launch and recovery operations using hand or light signals; and maintaining logs of airplane launches, recoveries, and equipment maintenance.

#### 55-3013 Armored Assault Vehicle Crew Members

Operate tanks, light armor, and amphibious assault vehicles during combat situations on land or in aquatic environments. Duties include driving armored vehicles which require specialized training; operating and maintaining targeting and firing systems; operating and maintaining advanced onboard communications and navigation equipment; transporting personnel and equipment in a combat environment; and operating and maintaining auxiliary weapons, including machine guns and grenade launchers.

#### 55-3014 Artillery and Missile Crew Members

Target, fire, and maintain weapons used to destroy enemy positions, aircraft, and vessels. Field artillery crew members predominantly use guns, cannons, and howitzers in ground combat operations, while air defense artillery crew members predominantly use missiles and rockets. Naval artillery crew members predominantly use torpedoes and missiles launched from a ship or submarine. Duties include testing, inspecting, and storing ammunition, missiles, and torpedoes; conducting preventive and routine maintenance on weapons and related equipment; establishing and maintaining radio and wire communications; and operating weapons targeting, firing, and launch computer systems.

#### 55-3015 Command and Control Center Specialists

Operate and monitor communications, detection, and weapons systems essential for controlling air, ground, and naval operations. Duties include maintaining and relaying critical communications between air, naval, and ground forces; implementing emergency plans for natural and wartime disasters; relaying command center information to high-level military and government decision makers; monitoring surveillance and detection systems, such as air defense; interpreting and evaluating tactical situations and making recommendations to superiors; and operating weapons targeting, firing, and launch computer systems.

#### 55-3016 Infantry

Operate weapons and equipment in ground combat operations. Duties include operating and maintaining weapons, such as rifles, machine guns, mortars, and hand grenades; locating, constructing, and camouflaging infantry positions and equipment; evaluating terrain and recording topographical information; operating and maintaining field communications equipment; assessing need for and directing supporting fire; placing explosives and performing minesweeping activities on land; and participating in basic reconnaissance operations.

#### 55-3017 Radar and Sonar Technicians

Operate equipment using radio or sound wave technology to identify, track, and analyze objects or natural phenomena of military interest. Include airborne, shipboard, and terrestrial positions. May perform minor maintenance.

#### 55-3018 Special Forces

Implement unconventional operations by air, land, or sea during combat or peacetime as members of elite teams. These activities include offensive raids, demolitions, reconnaissance, search and rescue, and counterterrorism. In addition to their combat training, special forces members often have specialized training in swimming, diving, parachuting, survival, emergency medicine, and foreign languages. Duties include conducting advanced reconnaissance operations and collecting intelligence information; recruiting, training, and equipping friendly forces; conducting raids and invasions on enemy territories; laying and detonating explosives for demolition targets; locating, identifying, defusing, and disposing of ordnance; and operating and maintaining sophisticated communications equipment.

#### 55-3019 Military Enlisted Tactical Operations and Air/Weapons Specialists and Crew Members, All Other

All military enlisted tactical operations and air/weapons specialists and crewmembers not listed separately.



