

Program Endorsement Brief:

Butte College: Advanced Manufacturing

North/Far North Center of Excellence, October 2018

INTRODUCTION

Butte College is revising an existing Advanced Manufacturing program to update the curriculum. This report provides an overview of the labor market demand and supply for related manufacturing occupations. It provides an overview of the employment opportunities and existing community college programs that prepare students for the profession.

Key findings include:

- The occupations selected reveal a disparity: a large share of the workforce in manufacturing are low wage production work—assemblers in this case.
- There are few annual openings projected in the Far North for technician-level occupations, fewer than 50 annual openings. Of the 1,000 annual openings projected over the next five years in the North/Far North, nearly 900 of them are for assemblers.
- The occupational data suggests that many of the industries that employ manufacturing production workers and technicians have not fully recovered.
- Wages for technicians, electro-mechanical technicians, engineering technicians, and CNC programmers are strong, and range from \$27 per hour to \$30 per hour. Wages for computer-controlled machine operators is about \$20 per hour. Wages for assemblers is the lowest of the group, just \$13.50 per hour.
- Related job postings volume has been flat, about 600 to 650 a year.

Findings in this report were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi and job posting data from Burning Glass.

The report contains the following sections:

- Occupational demand,
- Wages and job postings,
- Educational attainment and supply, and
- Findings and recommendations.

OCCUPATIONAL DEMAND

Five Standard Occupational Classification (SOC) codes were analyzed in relation to the proposed program. Exhibit 1 summarizes job trends per the SOC codes in the 15-county Far North region, the 22-county North/Far North region and California.

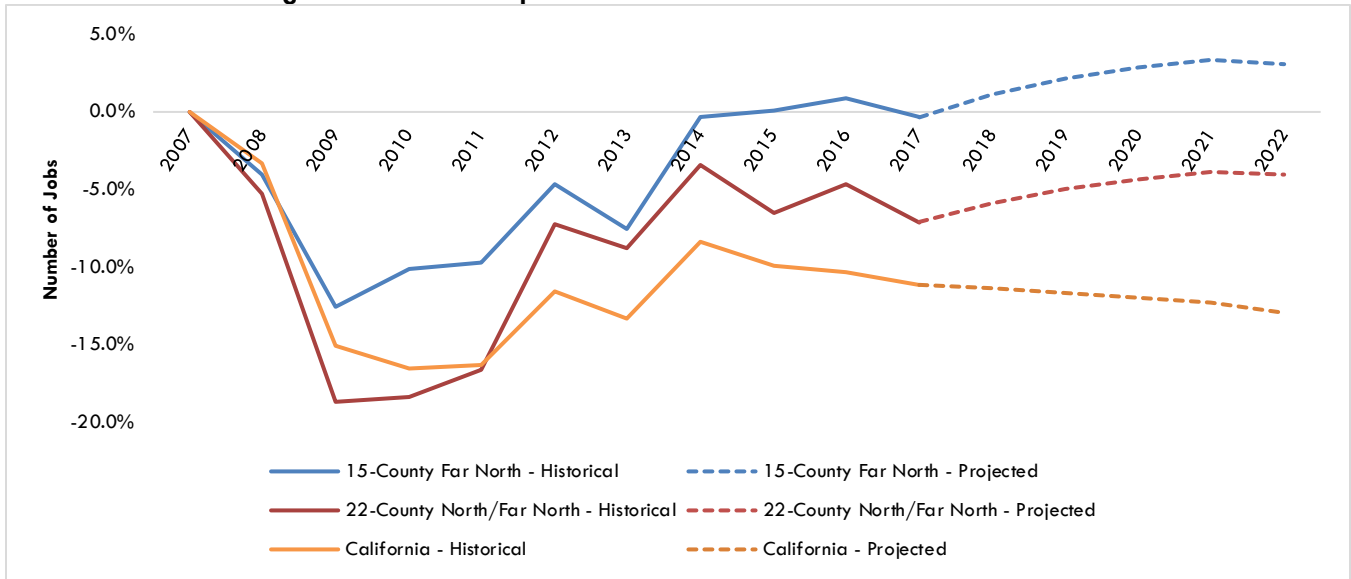
Exhibit 1: Employment, projected occupational demand¹

| Occupation | SOC | 2007 Jobs | 2017 Jobs | 2022 Jobs | 2017-22 Jobs % Change | Annual Openings |
|--|--------------|----------------|----------------|----------------|-----------------------|-----------------|
| Electro-Mechanical Technicians | 17-3024 | 11 | 10 | 12 | 12.1% | 2 |
| Engineering Technicians, Except Drafters | 17-3029 | 143 | 154 | 161 | 4.8% | 17 |
| Assemblers and Fabricators | 51-2098 | 1,547 | 1,533 | 1,572 | 2.5% | 216 |
| Computer-Controlled Machine Tool Operators | 51-4011 | 74 | 67 | 78 | 16.4% | 10 |
| CNC Machine Tool Programmers | 51-4012 | 12 | 16 | 20 | 20.3% | 3 |
| 15-County Far North Region | TOTAL | 1,787 | 1,781 | 1,842 | 3.5% | 246 |
| Electro-Mechanical Technicians | 17-3024 | 204 | 126 | 131 | 4.0% | 20 |
| Engineering Technicians, Except Drafters | 17-3029 | 651 | 632 | 663 | 4.9% | 69 |
| Assemblers and Fabricators | 51-2098 | 6,811 | 6,307 | 6,460 | 2.4% | 873 |
| Computer-Controlled Machine Tool Operators | 51-4011 | 376 | 392 | 438 | 11.7% | 50 |
| CNC Machine Tool Programmers | 51-4012 | 40 | 53 | 64 | 22.1% | 8 |
| 22-County North/Far North Region | TOTAL | 8,081 | 7,509 | 7,755 | 3.3% | 1,020 |
| Electro-Mechanical Technicians | 17-3024 | 3,504 | 2,681 | 2,681 | 0.0% | 320 |
| Engineering Technicians, Except Drafters | 17-3029 | 11,332 | 10,969 | 11,266 | 2.7% | 1,088 |
| Assemblers and Fabricators | 51-2098 | 126,660 | 108,828 | 105,252 | -3.3% | 14,436 |
| Computer-Controlled Machine Tool Operators | 51-4011 | 11,434 | 12,243 | 12,523 | 2.3% | 1,387 |
| CNC Machine Tool Programmers | 51-4012 | 1,763 | 2,750 | 2,961 | 7.7% | 349 |
| California | TOTAL | 154,693 | 137,470 | 134,683 | -2.0% | 17,579 |

Exhibit 2 shows the percentage change in number of jobs between 2007 through 2017 and occupational projections from 2017 through 2022. The rate of change is indexed to the total number of jobs in 2007 as the base year and compares 15-county Far North region, 22-county North/Far North region and California.

¹ Emsi 2018.2; QCEW Employees, Non-QCEW Employees and Self-Employed. The 15-county Far North region includes Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama and Trinity. The 22-county North/Far North region includes the aforementioned counties as well as El Dorado, Placer, Nevada, Sacramento, Sutter, Yolo and Yuba.

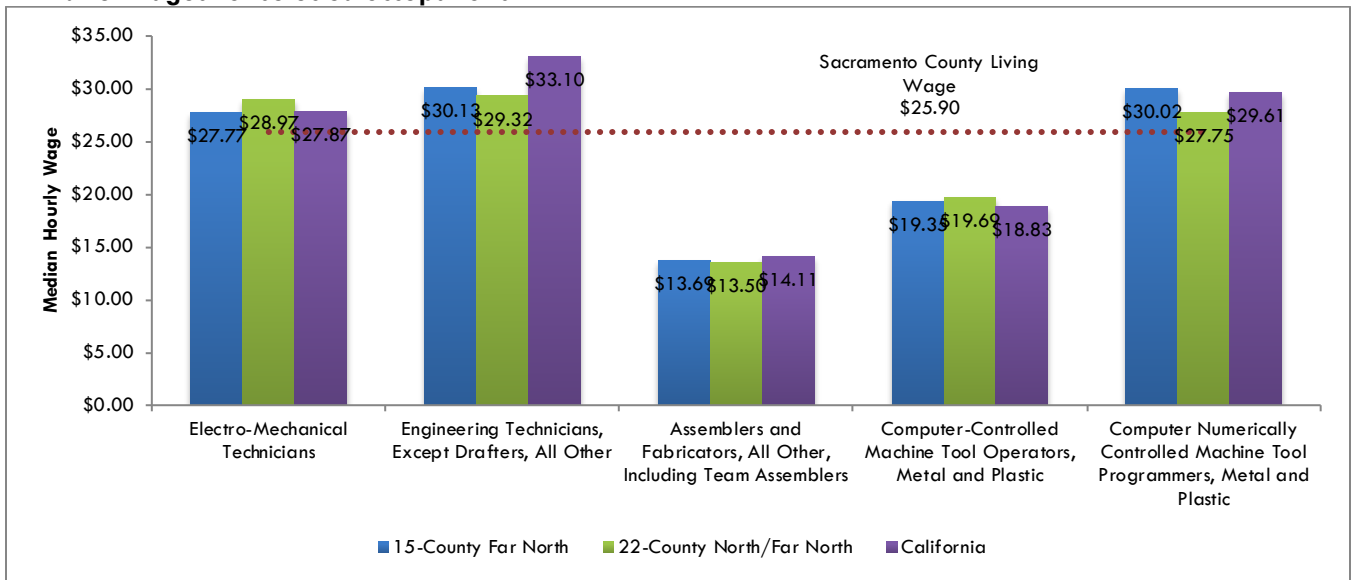
Exhibit 2: Rate of change for selected occupations²



WAGES AND JOB POSTINGS

Exhibit 3 displays hourly wages for selected occupations in the study regions compared to the Sacramento County living wage for a one-adult, one-child household.³ The chart highlights the difference between the median wages of the representative occupations.

Exhibit 3: Wages for selected occupations⁴



Burning Glass data for job postings identified a pool of 805 listings in the North/Far North region on the representative SOC codes. There were only 46 listings in the Far North region for the same occupations. As such, only the larger North/Far North pool was analyzed. Data was pulled for the last year from September 1, 2017 through August 31, 2018.

² Ibid.

³ Living Wage Calculator: Counties and Metropolitan Statistical Areas in California, <http://livingwage.mit.edu/states/06/locations>.

⁴ Emsi 2018.2; QCEW Employees, Non-QCEW Employees and Self-Employed.

Exhibit 4 presents the job postings trend for the SOC codes over the past 10 years compared to the median during the same period for the study regions.

Exhibit 4: Job posting trend for selected occupations⁵

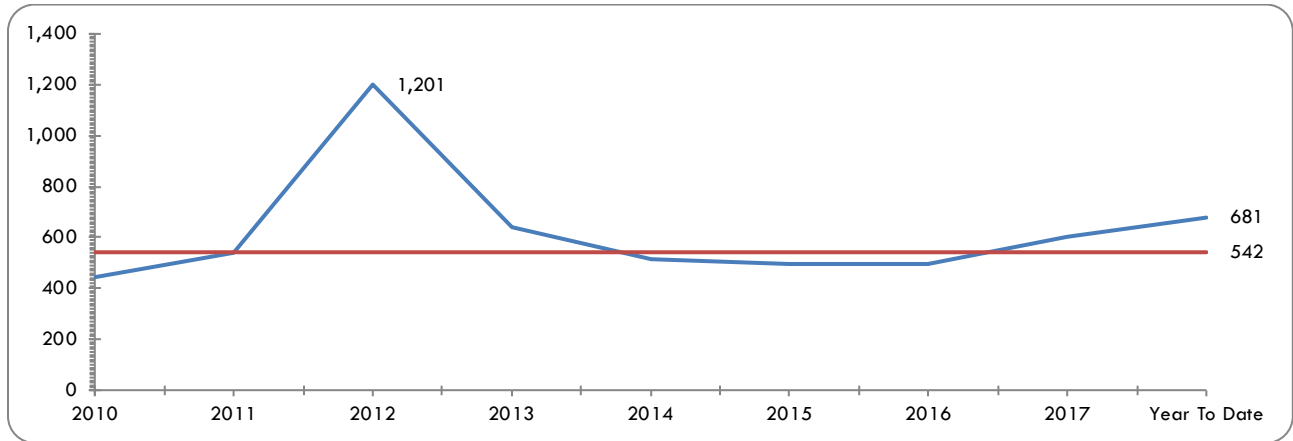


Exhibit 5 shows the top titles for positions within the selected occupations that were present in the job postings.

Exhibit 5: Top titles for selected occupations⁶

| Top Titles | North/Far North | |
|----------------------------|-----------------|-----------------|
| | Number | Percent (n=805) |
| Assembler | 97 | 12.0% |
| Production Technician | 66 | 8.2% |
| Engineering Technician | 44 | 5.5% |
| Engineer | 38 | 4.7% |
| Calibration Technician | 34 | 4.2% |
| Electronics Technician | 33 | 4.1% |
| Instrumentation Technician | 31 | 3.9% |
| Assembly Technician | 30 | 3.7% |

Exhibit 6 shows the top employers for selected occupation jobs postings in the study regions. There were only 515 postings with employer information, therefore the results below may not be indicative of the entire sample.

Exhibit 6: Top Employers among selected occupations⁷

| Top Employers | North/Far North | |
|---------------------------------|-----------------|-----------------|
| | Number | Percent (n=515) |
| Jones Lang Lasalle Incorporated | 14 | 2.7% |
| Spar | 12 | 2.3% |
| Accenture | 9 | 1.7% |
| Department of Veterans Affairs | 9 | 1.7% |
| Walgreens Boots Alliance Inc | 9 | 1.7% |
| Spar Business Services | 7 | 1.4% |
| Tekberry | 7 | 1.4% |
| Atwork | 6 | 1.2% |

⁵ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool," 2018.

⁶ Ibid.

⁷ Ibid.

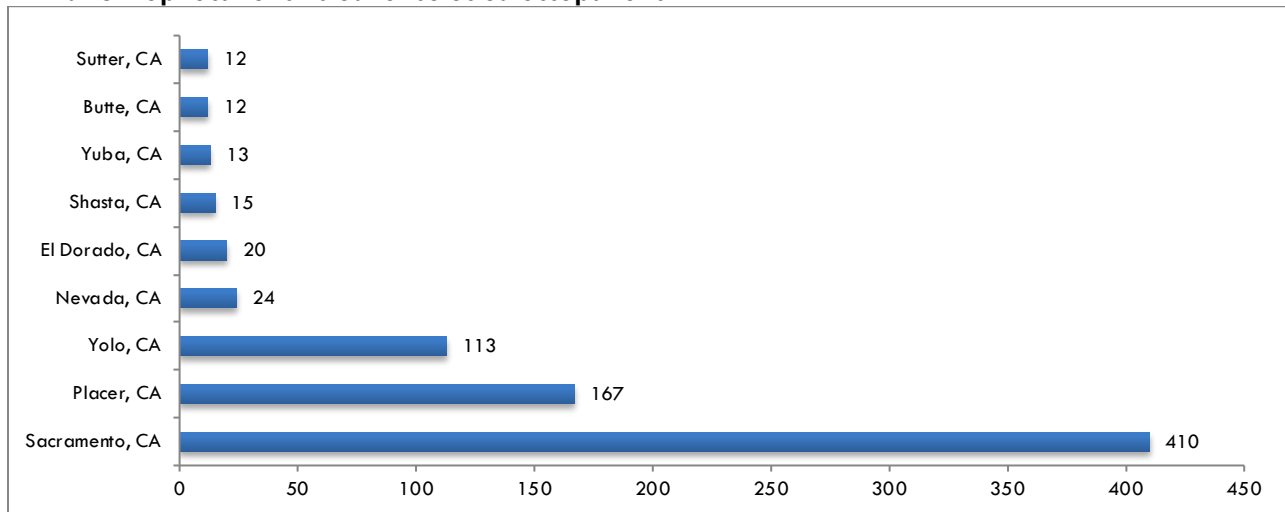
Exhibit 7 shows the top skills desired within selected occupation positions in the study regions. There were only 655 postings with skill information, therefore the results below may not be indicative of the entire sample.

Exhibit 7: Top skills among selected occupations ⁸

| Top Skills | North/Far North | |
|-------------------------------|-----------------|-----------------|
| | Number | Percent (n=655) |
| Repair | 206 | 31.5% |
| Hand Tools | 94 | 14.4% |
| Test Equipment | 90 | 13.7% |
| Customer Service | 83 | 12.7% |
| Calibration | 74 | 11.3% |
| Quality Assurance and Control | 70 | 10.7% |
| Scheduling | 66 | 10.1% |
| Soldering | 64 | 9.8% |

Exhibit 8 shows the counties where selected occupations postings were located.

Exhibit 8: Top locations listed for selected occupations ⁹



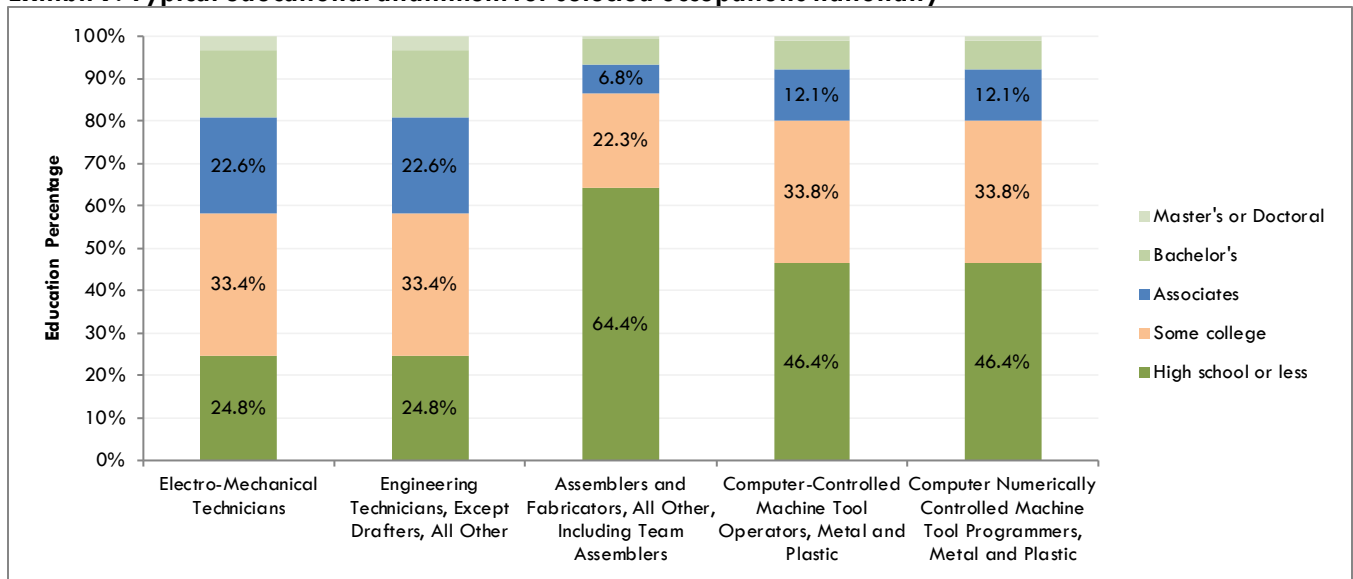
EDUCATIONAL ATTAINMENT AND SUPPLY

At the national level, the typical education required for the selected occupations is a high school diploma or some college. Engineering and electro-mechanical technicians generally required more advance education. Exhibit 9 breaks down the educational attainment percentages by occupation type.

⁸ Ibid.

⁹ Ibid.

Exhibit 9: Typical educational attainment for selected occupations nationally¹⁰

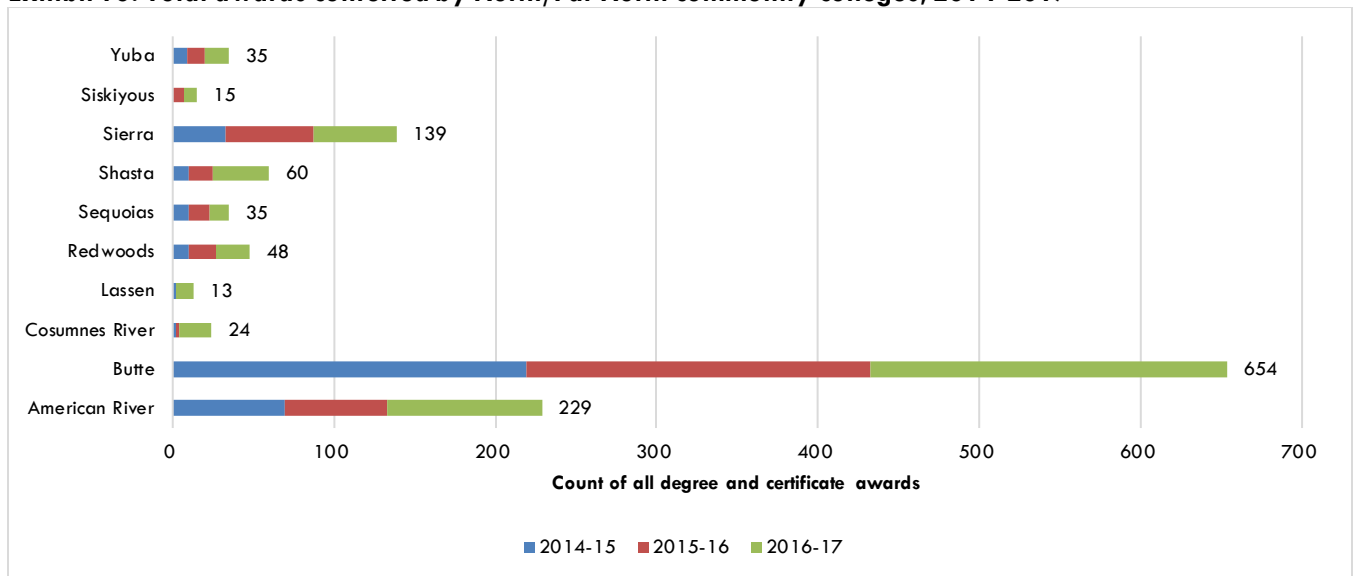


There was one Taxonomy of Programs (TOP) code identified that relates to Advanced Manufacturing: Manufacturing and Industrial Technology (0956.00).

There are eleven schools in the North/Far North region that offer related training, the most active of which are Butte, American River and Sierra colleges. Nearly all awards are certificates. Butte confers the majority of awards. The chart below displays total awards conferred during the 2014-2017 academic years. The most recent 2017-18 school year did not include data for Butte. As such, the previous three years were analyzed since they contained reporting information for all regional schools. Woodland's program was only active in 2017-18.

Exhibit 10 shows the total number of awards by colleges during the past three academic years.

Exhibit 10: Total awards conferred by North/Far North community colleges, 2014-2017¹¹



¹⁰ Current Population Survey, Educational Attainment for Workers 25 Years and Older by Detailed Occupation, 2014-2015, https://www.bls.gov/emp/ep_table_111.htm.

¹¹ COE Supply Tables, California Community Colleges Chancellor's Office DataMart, Integrated Postsecondary Education Data System (IPEDS).

Exhibit 11 shows the break down between certificates and associate degrees for the past four academic years.

Exhibit 11: Certificates and associate degrees conferred by North/Far North community colleges, 2014-2017¹²

| | Certificate | | | | Associate | | | |
|----------------|-------------|------------|------------|------------|-----------|-----------|-----------|-----------|
| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2014-15 | 2015-16 | 2016-17 | 2017-18 |
| American River | 61 | 55 | 83 | 59 | 8 | 9 | 13 | 11 |
| Butte* | 213 | 208 | 215 | 0 | 6 | 5 | 7 | 0 |
| Cosumnes River | 1 | 0 | 18 | 7 | 1 | 2 | 2 | 0 |
| Lassen | 1 | 0 | 10 | 3 | 1 | 0 | 1 | 0 |
| Redwoods | 7 | 12 | 12 | 4 | 3 | 5 | 9 | 7 |
| Sequoias | 7 | 9 | 7 | 10 | 3 | 4 | 5 | 7 |
| Shasta | 5 | 6 | 17 | 15 | 5 | 9 | 18 | 10 |
| Sierra | 29 | 41 | 40 | 30 | 4 | 13 | 12 | 14 |
| Siskiyou | 0 | 4 | 5 | 0 | 0 | 3 | 3 | 0 |
| Woodland | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 |
| Total | 331 | 344 | 418 | 137 | 33 | 52 | 74 | 55 |

*No data was reported for the 2017-18 school year for Butte College.

FINDINGS

- The occupations selected reveal a disparity: a large share of the workforce in manufacturing are low wage production work—assemblers in this case. Here, the most demand comes from the lowest paid occupation, Assemblers and Fabricators. In the Far North, of the 250 annual openings—new jobs, retirements, and separations—projected for all occupations, more than 200 openings are attributed to Assemblers.
- There are few annual openings projected in the Far North for technician-level occupations, fewer than 50 annual openings. In the Sacramento region, annual openings for technicians increases to the dozens, but does not represent a large number. Most positions are in the Sacramento region, where there is a larger manufacturing and other industrial activity. Of the 1,000 annual openings projected over the next five years in the North/Far North, nearly 900 of them are for assemblers.
- The occupational data suggests that many of the industries that employ manufacturing production workers and technicians have not fully recovered. The workforce totals are still below 2007 levels.
- Wages for technicians, electro-mechanical technicians, engineering technicians, and CNC programmers are strong, and range from \$27 per hour to \$30 per hour. Wages for computer-controlled machine operators is about \$20 per hour. Wages for assemblers is the lowest of the group, just \$13.50 per hour.
- Related job postings volume has been flat, about 600 to 650 a year.

¹² COE Supply Tables, California Community Colleges Chancellor's Office DataMart, Integrated Postsecondary Education Data System (IPEDS).

RECOMMENDATIONS

- The research selected the occupations most closely aligned with the proposed program. The research did not analyze maintenance and repair occupations, where there is additional demand beyond the technician occupations included here. The report also does not analyze machinists and other related machining positions, like tool and die makers, for example. More demand for technician-level positions are located in those two areas. The COE has conducted recent surveys, and produced reports in both areas. Each presents ripe areas for program development, however the colleges have created several programs to address machinists, probably fulfilling demand. Industrial maintenance mechanics represents the strongest area of need from the community colleges, where there are no comprehensive programs.
- Any program development in the rural Far North should be done at a regional level. Most job opportunities will not be in the local community where the program resides. This does not mean that the programs do not support local manufacturing and industrial operations. In many cases, these programs represent crucial workforce-economic development initiatives.
- Further research can provide industry and occupational profiles for the region that will expand on the specific occupations analyzed here.
- As a general assessment for several related occupations in manufacturing and other industrial occupations, the report does not offer a go-no-go recommendation.

APPENDIX A: DATA SOURCES

Sources used for data analysis purposes in this report include:

- U.S. Department of Labor/Employment and Training Administration (DOLETA) O*NET Online
- Burning Glass, Labor Insight/Jobs
- Economic Modeling Specialists, International (EMSI)
- California Employment Development Department, Labor Market Information Division (EDD, LMID)
- Bureau of Labor Statistics, Occupational Employment Statistics (OES)
- California Community Colleges Chancellor's Office, Cal-PASS Plus LaunchBoard
- Living Insight Center for Community Economic Development, Self-Sufficiency Standard Tool for California
- California Community Colleges Chancellor's Office Management Information Systems (MIS Data Mart)
- U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)

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October 2018

