

Program Endorsement Brief: 0934.00/Electronics and Electric Technology Los Angeles/Orange County Center of Excellence, March 2020

Summary Analysis

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to five middle-skill occupations: Electrical and Electronics Engineering Technicians (17-3023); Electric Motor, Power Tool, and Related Repairers (49-2092); Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093); Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094); and Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.¹ This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a slight supply gap for electrical engineering-related workers in the region. **Therefore, the COE cautiously endorses this proposed program.** Reasons include:

Demand:

- Over the next five years, there is projected to be **920 jobs available annually** in the region due to retirements and workers leaving the field, **which is more than the 876 awards conferred annually** by educational institutions in the region.
- The national-level educational attainment data indicates between **47.1% and 53.1% of workers in the field have completed some college or an associate degree.**
- Typical **entry-level hourly wages** for electrical engineering-related jobs throughout the region are between \$17.23 and \$42.41, **which are higher than the California Family Needs Calculator** hourly wage for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County).²

Supply:

- **Twenty-two community colleges** in the region offer programs that have historically trained for the occupations of interest – conferring an average of **831 awards annually** between 2016 and 2019.
- Between 2013 and 2016, there were an average of **45 awards conferred annually** in related training programs by non-community college institutions in the region.

¹ The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

² Living wage data was pulled from California Family Needs Calculator. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for five electrical engineering-related occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 1% through 2023. However, there will be more than 900 job openings per year through 2023 due to retirements and workers leaving the field.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

| Geography | 2018 Jobs | 2023 Jobs | 2018-2023 Change | 2018-2023 % Change | Annual Openings |
|--------------|---------------|---------------|------------------|--------------------|-----------------|
| Los Angeles | 7,006 | 6,871 | (135) | (2%) | 605 |
| Orange | 3,524 | 3,544 | 20 | 1% | 314 |
| Total | 10,531 | 10,415 | (116) | (1%) | 920 |

Wages — Typical entry-level hourly wages for electrical engineering-related occupations throughout the region are between \$17.23 and \$42.41.⁴ Entry-level wages for these occupations are higher than the California Family Needs Calculator hourly wage for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County).⁵ Experienced workers can expect to earn between \$26.26 and \$59.00, which is significantly higher than the California Family Needs Calculator wage estimates for both counties. Wage information, by county, is included in Appendix A.

Job Postings — There were 1,739 online job postings for the five electrical engineering-related occupations listed in the past 12 months. The highest number of job postings were for electronics technician, test technician, electrical technician, low voltage technician, and machining technician. The top skills were: repair, test equipment, schematic diagrams, wiring, and soldering. The top employers, by number of job postings, in the region were: Arconic, Northrop Grumman, Alcoa, and PPG Industries. Of the 1,739 online job postings, 50% list a minimum education requirement.

Educational Attainment — The Bureau of Labor Statistics (BLS) lists the following education levels for each of the five electrical engineering-related occupations:

- Associate degree: Electrical and Electronics Engineering Technicians
- Postsecondary non-degree award: Electrical and electronics Installers and Repairers, Transportation Equipment; Electrical and Electronics Repairers, Commercial and Industrial Equipment; Electrical and Electronics Repairers, Powerhouse, Substation, and Relay
- High school diploma: Electrical Motor, Power Tool, and Related Repairers

The national-level educational attainment data indicates between 47.1% and 53.1% of workers in the field have completed some college or an associate degree. Of the 50% of job postings for electrical engineering-related occupations listing a minimum education requirement in Los

³ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

⁴ Entry-level wage is defined as the twenty-fifth percentile hourly wage. Wages for experienced workers are defined as the seventy-fifth percentile hourly wage.

⁵ Living wage data was pulled from California Family Needs Calculator. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

Angeles/Orange County, 70% (612) requested a high school diploma and 30% (260) requested an associate degree.

Supply

Community College Supply — Exhibit 2 shows the annual and three-year average number of awards conferred by programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are Pasadena, LA Trade-Tech, and Coastline. During 2019, there were no other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019

| TOP Code | Program | College | 2016-2017 Awards | 2017-2018 Awards | 2018-2019 Awards | 3-Year Award Average |
|--------------------------------|-------------------------------------|--------------------|------------------|------------------|------------------|----------------------|
| 0924.00 | Engineering Technology, General | Cerritos | 6 | 23 | 26 | 18 |
| | | East LA | 1 | - | - | 0 |
| | | Glendale | 12 | 17 | 14 | 14 |
| | | Pasadena | 122 | 173 | 176 | 157 |
| | | LA Subtotal | 141 | 213 | 216 | 190 |
| | | Santa Ana | 5 | 1 | 1 | 2 |
| | | OC Subtotal | 5 | 1 | 1 | 2 |
| Supply Subtotal/Average | | | 146 | 214 | 217 | 192 |
| 0934.00 | Electronics and Electric Technology | East LA | 12 | 15 | 4 | 10 |
| | | El Camino | 6 | 11 | 9 | 9 |
| | | Glendale | 9 | 4 | 1 | 5 |
| | | LA City | 14 | - | - | 5 |
| | | LA Pierce | 40 | 14 | 11 | 22 |
| | | LA Southwest | 4 | 2 | - | 2 |
| | | LA Valley | 24 | 15 | 25 | 21 |
| | | Long Beach | 44 | 46 | 55 | 48 |
| | | Mt San Antonio | 36 | 54 | 42 | 44 |
| | | Pasadena | 27 | 31 | 27 | 28 |
| | | Rio Hondo | 1 | 9 | 3 | 4 |
| | | LA Subtotal | 217 | 201 | 177 | 198 |
| | | Coastline | 100 | 95 | 88 | 94 |
| | | Irvine Valley | 25 | 20 | 17 | 21 |
| | | Orange Coast | 7 | 11 | 4 | 7 |
| | | Saddleback | 17 | 8 | 13 | 13 |
| OC Subtotal | 149 | 134 | 122 | 135 | | |
| Supply Subtotal/Average | | | 366 | 335 | 299 | 333 |

| TOP Code | Program | College | 2016-2017 Awards | 2017-2018 Awards | 2018-2019 Awards | 3-Year Award Average |
|--------------------------------|---|--------------------|------------------|------------------|------------------|----------------------|
| 0934.10 | Computer Electronics | East LA | - | 50 | 35 | 28 |
| | | El Camino | 15 | 13 | 15 | 14 |
| | | LA City | 5 | 1 | - | 2 |
| | | LA Harbor | 3 | - | - | 1 |
| | | LA Trade-Tech | 9 | 11 | 8 | 9 |
| | | LA Valley | 1 | 1 | - | 1 |
| | | Mt San Antonio | 13 | 10 | 10 | 11 |
| | | LA Subtotal | 46 | 86 | 68 | 67 |
| | | Orange Coast | 3 | 7 | 4 | 5 |
| | | Saddleback | 10 | 18 | 19 | 16 |
| | | OC Subtotal | 13 | 25 | 23 | 20 |
| Supply Subtotal/Average | | | 59 | 111 | 91 | 87 |
| 0934.20 | Industrial Electronics | El Camino | - | 1 | - | 0 |
| | | LA Subtotal | 0 | 1 | 0 | 0 |
| Supply Subtotal/Average | | | 0 | 1 | 0 | 0 |
| 0934.40 | Electrical Systems and Power Transmission | LA Trade-Tech | - | 1 | - | 0 |
| | | LA Subtotal | 0 | 1 | 0 | 0 |
| | | Santiago Canyon | 1 | 3 | 166 | 57 |
| OC Subtotal | | | 1 | 3 | 166 | 57 |
| Supply Subtotal/Average | | | 1 | 4 | 166 | 57 |
| 0945.00 | Industrial Systems Technology and Maintenance | LA Harbor | 1 | 1 | 1 | 1 |
| | | LA Trade-Tech | 122 | 94 | 90 | 102 |
| | | Long Beach | 1 | 1 | - | 1 |
| | | LA Subtotal | 124 | 96 | 91 | 104 |
| | | Fullerton | - | 2 | - | 1 |
| | | Santiago Canyon | 8 | 6 | 23 | 12 |
| OC Subtotal | | | 8 | 8 | 23 | 13 |
| Supply Subtotal/Average | | | 132 | 104 | 114 | 117 |
| 0956.00 | Manufacturing and Industrial Technology | Cerritos | 3 | 6 | 2 | 4 |
| | | Compton | - | 2 | - | 1 |
| | | El Camino | 3 | 3 | 2 | 3 |
| | | LA Trade-Tech | - | - | 5 | 2 |
| | | LA Valley | 4 | 2 | 3 | 3 |
| | | Mt San Antonio | 17 | 9 | 13 | 13 |
| | | LA Subtotal | 27 | 22 | 25 | 25 |

| TOP Code | Program | College | 2016-2017 Awards | 2017-2018 Awards | 2018-2019 Awards | 3-Year Award Average |
|--------------------------------|---------|--------------------|------------------|------------------|------------------|----------------------|
| | | Fullerton | 3 | 11 | 9 | 8 |
| | | Irvine Valley | 7 | 1 | 3 | 4 |
| | | Saddleback | 5 | 9 | 11 | 8 |
| | | Santa Ana | - | 1 | - | 0 |
| | | OC Subtotal | 15 | 22 | 23 | 20 |
| Supply Subtotal/Average | | | 42 | 44 | 48 | 45 |
| Supply Total/Average | | | 746 | 813 | 935 | 831 |

Non-Community College Supply — It is important to consider the supply from non-community college institutions in the region that may provide relevant training programs. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Electrical and Electronic Engineering Technologies/Technicians, Other (15.0399), Electrical and Power Transmission Installation/Installer, General (46.0301), and Computer Installation and Repair Technology/Technician (47.0104). Due to different data collection periods, the most recent three-year period of available data is from 2013 to 2016. Between 2013 and 2016, institutions in the region conferred an average of 45 awards annually in related training programs.

Exhibit 3: Regional Non-Community College awards, 2013-2016

| CIP Code | Program | College | 2013-2014 Awards | 2014-2015 Awards | 2015-2016 Awards | 3-Year Award Average |
|-----------------------------|---|---|------------------|------------------|------------------|----------------------|
| 15.0399 | Electrical and Electronic Engineering Technologies/Technicians, Other | Southern California Institute of Technology | 1 | 1 | 4 | 2 |
| 46.0301 | Electrical and Power Transmission Installation/Installer, General | InterCoast Colleges-Anaheim | 22 | 27 | - | 16 |
| 47.0104 | Computer Installation and Repair Technology/Technician | United Education Institute-Anaheim | - | 42 | 39 | 27 |
| Supply Total/Average | | | 23 | 70 | 43 | 45 |

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

| Occupation (SOC) | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | Annual Openings | Entry-Level Hourly Earnings (25 th Percentile) | Median Hourly Earnings | Experienced Hourly Earnings (75 th Percentile) |
|---|--------------|--------------|--------------|---------------|-----------------|---|------------------------|---|
| Electrical and Electronics Engineering Technicians (17-3023) | 3,735 | 3,650 | (85) | (2%) | 316 | \$21.34 | \$28.82 | \$37.98 |
| Electric Motor, Power Tool, and Related Repairers (49-2092) | 1,004 | 979 | (25) | (2%) | 91 | \$16.95 | \$21.34 | \$25.76 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093) | 372 | 373 | 1 | 0% | 33 | \$33.69 | \$40.83 | \$45.59 |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094) | 1,409 | 1,370 | (39) | (3%) | 121 | \$20.09 | \$27.28 | \$36.68 |
| Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095) | 487 | 500 | 13 | 3% | 45 | \$42.90 | \$52.91 | \$59.67 |
| Total | 7,006 | 6,871 | (135) | (2%) | 605 | | | |

Exhibit 5. Orange County

| Occupation (SOC) | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | Annual Openings | Entry-Level Hourly Earnings (25th Percentile) | Median Hourly Earnings | Experienced Hourly Earnings (75th Percentile) |
|---|------------------|------------------|--------------------|----------------------|------------------------|--|-------------------------------|--|
| Electrical and Electronics Engineering Technicians (17-3023) | 2,105 | 2,127 | 22 | 1% | 186 | \$21.34 | \$28.67 | \$37.63 |
| Electric Motor, Power Tool, and Related Repairers (49-2092) | 419 | 417 | (2) | (0%) | 38 | \$17.98 | \$22.64 | \$27.35 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093) | 111 | 111 | 0 | 0% | 10 | \$33.57 | \$40.66 | \$45.43 |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094) | 686 | 694 | 8 | 1% | 61 | \$20.76 | \$28.21 | \$37.93 |
| Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095) | 204 | 195 | (9) | (4%) | 19 | \$41.31 | \$50.94 | \$57.47 |
| Total | 3,524 | 3,544 | 20 | 1% | 314 | | | |

Exhibit 6. Los Angeles and Orange Counties

| Occupation (SOC) | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | Annual Openings | Entry-Level Hourly Earnings (25th Percentile) | Median Hourly Earnings | Experienced Hourly Earnings (75th Percentile) |
|---|------------------|------------------|--------------------|----------------------|------------------------|---|-------------------------------|---|
| Electrical and Electronics Engineering Technicians (17-3023) | 5,840 | 5,777 | (63) | (1%) | 502 | \$21.34 | \$28.77 | \$37.85 |
| Electric Motor, Power Tool, and Related Repairers (49-2092) | 1,423 | 1,396 | (27) | (2%) | 129 | \$17.23 | \$21.71 | \$26.26 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093) | 483 | 484 | 1 | 0% | 43 | \$33.66 | \$40.79 | \$45.56 |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094) | 2,095 | 2,064 | (31) | (1%) | 182 | \$20.30 | \$27.59 | \$37.09 |
| Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095) | 691 | 694 | 3 | 0% | 64 | \$42.41 | \$52.28 | \$59.00 |
| Total | 10,531 | 10,415 | (116) | (1%) | 920 | | | |

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- Employment Development Department, Unemployment Insurance Dataset
- Living Insight Center for Community Economic Development
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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