C·O·E CENTERS OF EXCELLENCE FOR LABOR MARKET RESEARCH

# Program Endorsement Brief: 0934.00/ Electronics and Electric Technology
## *Basic Digital Technician*

Los Angeles/Orange County Center of Excellence, April 2021

### Summary Analysis

| Program Endorsement: | Endorsed: All Criteria Met ☐ | Endorsed: Some Criteria Met ☒ | Not Endorsed ☐ |
|---|---|---|---|

| Program Endorsement Criteria | | |
|---|---|---|
| **Supply Gap:** | Yes ☑ | No ☐ |
| **Living Wage:** (Entry-Level, 25th) | Yes ☐ | No ☑ |
| **Education:** | Yes ☑ | No ☐ |
| **Emerging Occupation(s)** | | |
| | Yes ☐ | No ☑ |

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 four middle-skill occupations:

- *Electrical and electronic engineering technologists and technicians* (17-3023);
- *Electrical and electronics installers and repairers, transportation equipment* (49-2093);
- *Electrical and electronics repairers, commercial and industrial equipment* (49-2094); and
- *Electrical, electronic, and electromechanical assemblers, except coil winders, tapers, and finishers* (51-2028).

Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.[1] Although the occupations in this report typically require a high school diploma, they are considered middle-skill because approximately one-third of workers in the field have completed some college or an associate degree. 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 supply gap for these occupations in the region. While the majority of job openings for the occupations have entry-level wages lower than the living wage in both Los Angeles and Orange counties, between 30% and 64% of workers in the field have completed some college or an associate degree. **Therefore, due to some of the criteria being met, the COE endorses this program.** Detailed reasons include:

[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.

**Demand:**

- ***Supply Gap Criteria –*** Over the next five years, there is projected to be **2,012 jobs available annually** in the region due to retirements and workers leaving the field, **which is more than the 1,426 awards conferred annually** by educational institutions in the region.
- ***Living Wage Criteria –*** In Los Angeles County, approximately 37% of annual job openings for these four occupations have entry-level wages above the county's living wage ($15.04/hour).[2]
- ***Educational Criteria –*** The Bureau of Labor Statistics (BLS) lists a high school diploma as the typical entry-level education for *electrical, electronic, and electromechanical assemblers, except coil winders, tapers, and finishers* (51-2028); a postsecondary non degree award for *electrical and electronics installers and repairers, transportation equipment* (49-2093) and *electrical and electronics repairers, commercial and industrial equipment* (49-2094); and an associate degree for *electrical and electronic engineering technologists and technicians* (17-3023).
    - National-level educational attainment data indicates **between 30% and 64% of workers in the field have completed some college or an associate degree.**

**Supply:**

- There are **23 community colleges** in the LA/OC region that issue awards related to the four digital technician occupations, conferring an average of **922 awards annually** between 2017 and 2020.
- Between 2014 and 2017, there was an average of **504 awards conferred annually** in related training programs by non-community college institutions.

[2] Living wage data was pulled from California Family Needs Calculator on 4/14/2021. 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 the four occupations of interest. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 4% through 2024. However, there will be more than 2,000 job openings per year through 2024 due to retirements and workers leaving the field.

*This report includes employment projection data by Emsi which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.*

**Exhibit 1: Occupational demand in Los Angeles and Orange Counties[3]**

| Geography | 2019 Jobs | 2024 Jobs | 2019-2024 Change | 2019-2024 % Change | Annual Openings |
|---|---|---|---|---|---|
| Los Angeles | 13,382 | 12,554 | (828) | (6%) | 1,165 |
| Orange | 9,278 | 9,179 | (99) | (1%) | 847 |
| **Total** | **22,660** | **21,733** | **(927)** | **(4%)** | **2,012** |

### Wages

The labor market endorsement in this report considers the entry-level hourly wages for the four occupations of interest in Los Angeles County, as they relate to the county's living wage. Orange County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

**Los Angeles County:** Approximately 37% of annual openings for these occupations have entry-level wages **above** the living wage for one adult ($15.04 in Los Angeles County). Typical entry-level hourly wages are in a range between $13.20 and $35.92. Experienced workers can expect to earn wages between $19.26 and $47.63, which are higher than the living wage estimate.

**Orange County:** Approximately 28% of annual openings for these occupations have entry-level wages **above** the living wage for one adult ($17.36 in Orange County). Typical entry-level hourly wages are in a range between $13.39 and $35.91. Experienced workers can expect to earn wages between $19.76 and $47.69, which are higher than the living wage estimate.

[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.

**Job Postings**
There were 1,854 online job postings for the four occupations of interest listed in the past 12 months. The highest number of job postings were for mechanical assembler, test technician, and low voltage technician. The top skills were repair, schematic diagrams, and wiring. The top employers, by number of job postings, in the region were The Boeing Company, Orange County Sanitation District, and L3Harris.

*It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.*

**Educational Attainment**
The Bureau of Labor Statistics (BLS) lists the following typical entry-level education for each of the occupations studied in this report:

- **Associate degree:** *electrical and electronic engineering technologists and technicians* (17-3023).
- **Postsecondary non degree award:** *electrical and electronics installers and repairers, transportation equipment* (49-2093) and *electrical and electronics repairers, commercial and industrial equipment* (49-2094); and
- **High school diploma or equivalent:** *electrical, electronic, and electromechanical assemblers, except coil winders, tapers, and finishers* (51-2028);

National-level educational attainment data indicates between 30% and 64% of workers in the field have completed some college or an associate degree. Of the 63% of job postings listing a minimum education requirement in Los Angeles/Orange County, 72% (845) requested a high school diploma, 20% (231) requested an associate degree, and 8% (91) requested a bachelor's degree.

## Educational 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. Programs include Engineering Technology, General (requires Trigonometry) (0924.00); Electronics and Electric Technology (0934.00); Computer Electronics (0934.10); Industrial Electronics (0934.20); Electrical Systems and Power Transmission (0934.40); Industrial Systems Technology and Maintenance (0945.00); and Manufacturing and Industrial Technology (0956.00).

The colleges with the most completions in the region are Pasadena and Santiago Canyon. Over the past 12 months, there were five other related program recommendation requests from regional community colleges.

**Exhibit 2: Regional community college awards (certificates and degrees), 2017-2020**

| TOP Code | Program | College | 2017-2018 Awards | 2018-2019 Awards | 2019-2020 Awards | 3-Year Award Average |
|---|---|---|---|---|---|---|
| 0924.00 | Engineering Technology, General (requires Trigonometry) | Cerritos | 23 | 26 | 15 | 21 |
| | | East LA | - | - | 1 | 0 |
| | | Glendale | 17 | 14 | 7 | 13 |
| | | Mt San Antonio | - | - | 2 | 1 |
| | | Pasadena | 173 | 176 | 216 | 188 |
| | | **LA Subtotal** | **213** | **216** | **241** | **223** |
| | | Santa Ana | 1 | 1 | 3 | 2 |
| | | **OC Subtotal** | **1** | **1** | **3** | **2** |
| | **Supply Subtotal/Average** | | **214** | **217** | **244** | **225** |
| 0934.00 | Electronics and Electric Technology | East LA | 15 | 4 | 1 | 7 |
| | | El Camino | 11 | 9 | 8 | 9 |
| | | Glendale | 4 | 1 | 5 | 3 |
| | | LA City | - | - | 4 | 1 |
| | | LA Pierce | 14 | 11 | 4 | 10 |
| | | LA Southwest | 2 | - | 9 | 4 |
| | | LA Valley | 15 | 25 | 14 | 18 |
| | | Long Beach | 46 | 55 | 50 | 50 |
| | | Mt San Antonio | 88 | 42 | 48 | 59 |
| | | Pasadena | 31 | 27 | 24 | 27 |
| | | Rio Hondo | 9 | 3 | - | 4 |
| | | **LA Subtotal** | **235** | **177** | **167** | **193** |
| | | Coastline | 95 | 88 | 58 | 80 |
| | | Irvine Valley | 20 | 17 | 37 | 25 |
| | | Orange Coast | 11 | 4 | 12 | 9 |
| | | Saddleback | 8 | 13 | 14 | 12 |

| TOP Code | Program | College | 2017-2018 Awards | 2018-2019 Awards | 2019-2020 Awards | 3-Year Award Average |
|---|---|---|---|---|---|---|
| | | Santa Ana | 3 | 5 | 8 | 5 |
| | | **OC Subtotal** | **137** | **127** | **129** | **131** |
| | **Supply Subtotal/Average** | | **372** | **304** | **296** | **324** |
| 0934.10 | Computer Electronics | East LA | 50 | 35 | 34 | 40 |
| | | El Camino | 13 | 15 | 6 | 11 |
| | | LA City | 1 | - | - | 0 |
| | | LA Trade | 11 | 8 | 10 | 10 |
| | | LA Valley | 1 | - | - | 0 |
| | | Mt San Antonio | 10 | 10 | 12 | 11 |
| | | **LA Subtotal** | **86** | **68** | **62** | **72** |
| | | Orange Coast | 7 | 4 | 5 | 5 |
| | | Saddleback | 18 | 19 | 13 | 17 |
| | | **OC Subtotal** | **25** | **23** | **18** | **22** |
| | **Supply Subtotal/Average** | | **111** | **91** | **80** | **94** |
| 0934.20 | Industrial Electronics | El Camino | 1 | - | - | 0 |
| | | **LA Subtotal** | **1** | **-** | **-** | **0** |
| | **Supply Subtotal/Average** | | **1** | **-** | **-** | **0** |
| 0934.40 | Electrical Systems and Power Transmission | LA Trade | 1 | - | - | 0 |
| | | **LA Subtotal** | **1** | **-** | **-** | **0** |
| | | Santiago Canyon | 3 | 166 | 56 | 75 |
| | | **OC Subtotal** | **3** | **166** | **56** | **75** |
| | **Supply Subtotal/Average** | | **4** | **166** | **56** | **75** |
| 0945.00 | Industrial Systems Technology and Maintenance | LA Harbor | 1 | 1 | 1 | 1 |
| | | LA Southwest | - | - | 9 | 3 |
| | | LA Trade | 94 | 90 | 61 | 82 |
| | | Long Beach | 1 | - | - | 0 |
| | | West LA | 19 | 14 | 20 | 18 |
| | | **LA Subtotal** | **115** | **105** | **91** | **104** |
| | | Fullerton | 2 | - | - | 1 |
| | | Santiago Canyon | 6 | 23 | 16 | 15 |
| | | **OC Subtotal** | **8** | **23** | **16** | **16** |
| | **Supply Subtotal/Average** | | **123** | **128** | **107** | **119** |
| 0956.00 | | Cerritos | 6 | 2 | - | 3 |

| TOP Code | Program | College | 2017-2018 Awards | 2018-2019 Awards | 2019-2020 Awards | 3-Year Award Average |
|---|---|---|---|---|---|---|
| | Manufacturing and Industrial Technology | Compton | 2 | - | - | 1 |
| | | El Camino | 3 | 2 | - | 2 |
| | | Glendale | - | - | 2 | 1 |
| | | LA Trade | - | 5 | 9 | 5 |
| | | LA Valley | 2 | 3 | 9 | 5 |
| | | Mt San Antonio | 9 | 13 | 14 | 12 |
| | | **LA Subtotal** | **22** | **25** | **34** | **27** |
| | | Fullerton | 11 | 9 | 38 | 19 |
| | | Irvine Valley | 1 | 3 | - | 1 |
| | | Saddleback | 9 | 11 | 7 | 9 |
| | | Santa Ana | 1 | - | 3 | 1 |
| | | Santiago Canyon | 27 | 41 | 10 | 26 |
| | | **OC Subtotal** | **49** | **64** | **58** | **57** |
| **Supply Subtotal/Average** | | | **71** | **89** | **92** | **84** |
| **Supply Total/Average** | | | **896** | **995** | **875** | **922** |

**Non-Community College Supply—**It is important to consider the supply from non-community college institutions in the region that provide training programs for these occupations. 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:15.0000/Engineering Technology, General; 15.0303/Electrical, Electronic and Communications Engineering Technology/Technician; 15.0612/Industrial Technology/Technician; 15.0613/ Manufacturing Engineering Technology/Technician; 15.0805/ Mechanical Engineering/Mechanical Technology/Technician; 15.1201/Computer Engineering Technology/Technician; 46.0301/ Electrical and Power Transmission Installation/Installer, General; and 47.0104/ Computer Installation and Repair Technology/Technician.

Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, non-community college institutions in the region conferred an average of 504 awards annually in related training programs.

**Exhibit 3: Regional non-community college awards, 2014-2017**

| CIP Code | Program | College | 2014-2015 Awards | 2015-2016 Awards | 2016-2017 Awards | 3-Year Award Average |
|---|---|---|---|---|---|---|
| 15.0000 | Engineering Technology, General | California State Polytechnic University-Pomona | 26 | 42 | 11 | 26 |
| | | California State University-Long Beach | 1 | - | - | - |
| 15.0303 | Electrical, Electronic and Communications Engineering Technology/Technician | California State Polytechnic University-Pomona | 28 | 34 | 34 | 32 |
| | | California State University-Long Beach | 18 | 16 | 13 | 16 |
| | | DeVry University-California | 94 | 66 | 41 | 67 |
| | | ITT Technical Institute-Orange | 64 | - | - | 21 |
| | | ITT Technical Institute-San Dimas | 38 | - | - | 13 |
| | | ITT Technical Institute-Sylmar | 40 | - | - | 13 |
| | | ITT Technical Institute-Torrance | 30 | - | - | 10 |
| 15.0612 | Industrial Technology/Technician | California State University-Los Angeles | 34 | 41 | 50 | 42 |
| 15.0613 | Manufacturing Engineering Technology/Technician | California State University-Long Beach | 2 | 5 | 2 | 3 |

| CIP Code | Program | College | 2014-2015 Awards | 2015-2016 Awards | 2016-2017 Awards | 3-Year Award Average |
|---|---|---|---|---|---|---|
| 15.0805 | Mechanical Engineering/Mechanical Technology/Technician | California State Polytechnic University-Pomona | - | - | 41 | 14 |
| 15.1201 | Computer Engineering Technology/Technician | California State University-Long Beach | 8 | 8 | 13 | 10 |
| | | DeVry University-California | 16 | 13 | 15 | 15 |
| 46.0301 | Electrical and Power Transmission Installation/Installer, General | InterCoast Colleges-Anaheim | 27 | - | - | 9 |
| | | InterCoast Colleges-West Covina | 31 | - | - | 10 |
| 47.0104 | Computer Installation and Repair Technology/Technician | ABCO Technology | 19 | 20 | 32 | 24 |
| | | Eagle Rock College | 1 | 4 | 1 | 2 |
| | | East San Gabriel Valley Regional Occupational Program | 24 | 15 | - | 13 |
| | | Hacienda La Puente Adult Education | 25 | 28 | 26 | 26 |
| | | UEI College-Gardena | 33 | 21 | 17 | 24 |
| | | United Education Institute-Anaheim | 42 | 39 | 24 | 35 |
| | | United Education Institute-Encino | 46 | 45 | 37 | 43 |
| | | United Education Institute-West Covina | 30 | 35 | 45 | 37 |
| | | **Supply Total/Average** | **677** | **432** | **402** | **504** |

## Appendix A: Occupational demand and wage data by county

### Exhibit 4. Los Angeles County

| Occupation (SOC) | 2019 Jobs | 2024 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 Electronic Engineering Technologists and Technicians (17-3023) | 3,874 | 3,732 | (142) | (4%) | 320 | $22.47 | $29.55 | $39.00 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093) | 407 | 399 | (8) | (2%) | 28 | $35.92 | $42.89 | $47.63 |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094) | 1,161 | 1,122 | (39) | (3%) | 78 | $18.79 | $26.77 | $38.57 |
| Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers (51-2028) | 7,940 | 7,301 | (639) | (8%) | 739 | $13.20 | $15.88 | $19.26 |
| **Total** | **13,382** | **12,554** | **(828)** | **(6%)** | **1,165** | | | |

**Exhibit 5. Orange County**

| Occupation (SOC) | 2019 Jobs | 2024 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 Electronic Engineering Technologists and Technicians (17-3023) | 2,222 | 2,220 | (2) | (0%) | 187 | $23.53 | $30.84 | $40.57 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093) | 133 | 132 | (2) | (1%) | 9 | $35.91 | $42.89 | $47.69 |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094) | 590 | 587 | (3) | (1%) | 40 | $19.69 | $28.06 | $40.41 |
| Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers (51-2028) | 6,333 | 6,241 | (92) | (1%) | 610 | $13.39 | $16.21 | $19.76 |
| **Total** | **9,278** | **9,179** | **(99)** | **(1%)** | **847** | | | |

**Exhibit 6. Los Angeles and Orange Counties**

| Occupation (SOC) | 2019 Jobs | 2024 Jobs | 5-Yr Change | 5-Yr % Change | Annual Openings | Typical Entry-Level Education |
|---|---|---|---|---|---|---|
| Electrical and Electronic Engineering Technologists and Technicians (17-3023) | 6,096 | 5,952 | (144) | (2%) | 507 | Associate degree |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093) | 541 | 531 | (9) | (2%) | 37 | Postsecondary nondegree award |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094) | 1,751 | 1,709 | (43) | (2%) | 118 | Postsecondary nondegree award |
| Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers (51-2028) | 14,272 | 13,542 | (731) | (5%) | 1,350 | High school diploma or equivalent |
| **Total** | **22,660** | **21,733** | **(927)** | **(4%)** | **2,012** | |

**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
- 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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April 2021