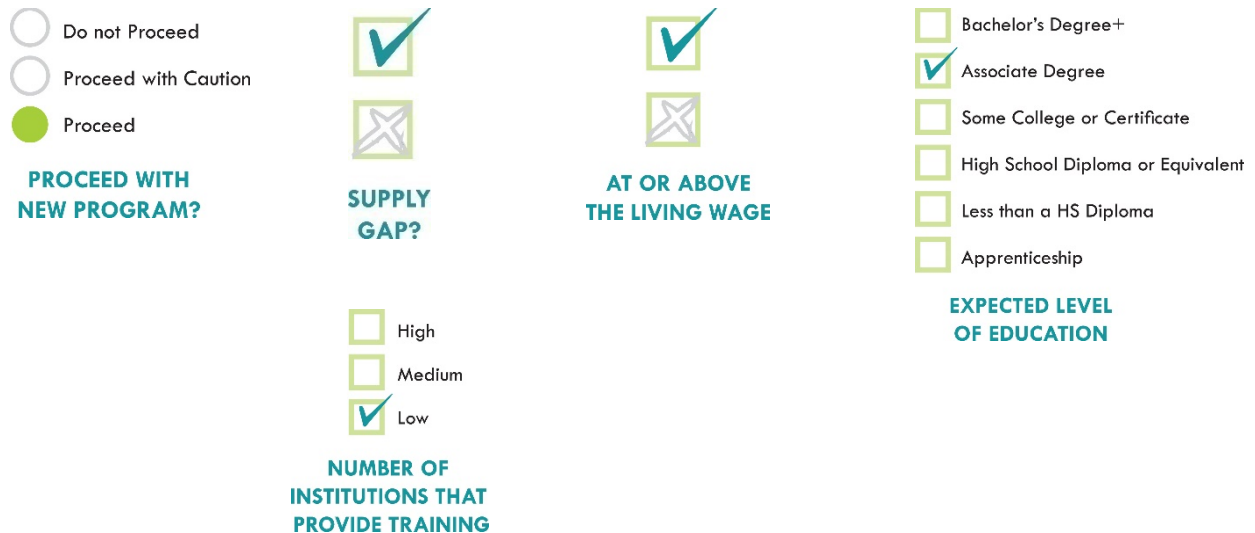


# Engineering Technician Occupations

Labor Market Analysis: San Diego County

August 2019

## Summary



The brief provides labor market information about *Engineering Technician Occupations* to assist the San Diego and Imperial Counties Community Colleges with decision-making in processes such as program development. According to available labor market information, there is a supply gap for occupations that could be trained by an *Engineering Technician* program. *Engineering Technician Occupations* include “Industrial Engineering Technicians” and “Engineering Technicians, Except Drafters, All Other.” *Engineering Technician Occupations* in San Diego County have a labor market demand of 259 annual job openings, and four educational institutions in San Diego County supply 17 awards for these occupations, suggesting that there is a supply gap. This occupation’s entry-level and median wages are above the living wage, suggesting that students who successfully complete a program and obtain employment in a related field may earn a living wage. According to the California Community Colleges’ outcomes data, 52 percent of students who complete Engineering Technology, General (TOP 092400) programs earned a living wage, compared to 58 percent of students who complete Career Education programs in general. Workers in this occupation typically have an educational requirement of an associate degree; however, according to online job postings, the top listed educational requirement for *Engineering Technician Occupations* is a high school diploma or vocational training.

## Introduction

This report provides labor market information in San Diego County for the following occupational codes in the Standard Occupational Classification (SOC)<sup>1</sup> system:

- **Industrial Engineering Technicians (SOC 17-3026):** 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.
- **Engineering Technicians, Except Drafters, All Other (SOC 17-3029):** All engineering technicians, except drafters, not listed separately. "All Other" titles represent occupations with a wide range of characteristics which do not fit into one of the detailed SOC occupations. For this report, Engineering Technicians, Except Drafters, All Other include:
  - **Electrical Engineering Technologists (SOC 17-3029.02):** Assist electrical engineers in such activities as process control, electrical power distribution, or instrumentation design. May prepare layouts of electrical transmission or distribution systems, supervise the flow of work, estimate project costs, or participate in research studies.
  - **Manufacturing Engineering Technologists (SOC 17-3029.06):** Develop tools, implement designs, or integrate machinery, equipment, or computer technologies to ensure effective manufacturing processes.
  - **Mechanical Engineering Technologists (SOC 17-3029.07):** Assist mechanical engineers in such activities as generation, transmission, or use of mechanical or fluid energy. Prepare layouts of machinery or equipment or plan the flow of work. May conduct statistical studies or analyze production costs.

For the purpose of this report, these occupations are referred to as *Engineering Technician Occupations*.

## Projected Occupational Demand

Between 2018 and 2023, *Engineering Technician Occupations* are projected to increase by 82 net jobs or three percent (Exhibit 1). Employers in San Diego County will need to hire 259 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

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<sup>1</sup> The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc/).

**Exhibit 1: Number of Jobs for Engineering Technician Occupations (2008-2023)<sup>2</sup>**

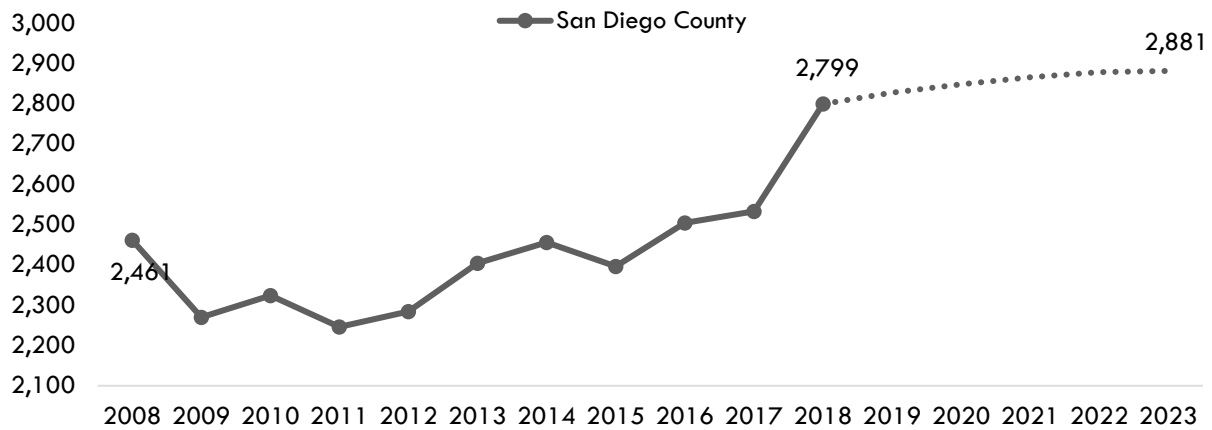


Exhibit 1b, below, breaks down the projected number of jobs change by occupation more specifically. As Exhibit 1b shows, labor market demand for *Engineering Technicians, Except Drafters, All Other* is projected to increase by 42 total jobs between 2018 and 2023.

**Exhibit 1b: Number of Jobs for Engineering Technician Occupations in San Diego County (2018-2023)**

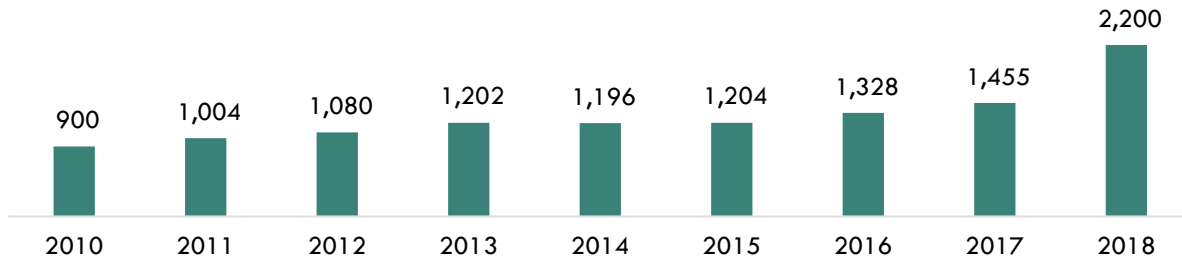
Occupational Title	2018 Jobs	2023 Jobs	2018 - 2023 Change	2018-2023 % Change	Annual Openings (Demand)
Engineering Technicians, Except Drafters, All Other	2,181	2,223	42	2%	196
Industrial Engineering Technicians	618	658	40	6%	63
<b>Total</b>	<b>2,799</b>	<b>2,881</b>	<b>82</b>	<b>3%</b>	<b>259</b>

## Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market demand that are not captured by historical data. Between 2010 and 2018, there was an average of **1,285** online job postings per year for *Engineering Technician Occupations* in San Diego County (Exhibit 2).

<sup>2</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

**Exhibit 2: Number of Online Job Postings for Engineering Technician Occupations in San Diego County (2010-2018)<sup>3</sup>**



## Earnings

The median hourly earnings of *Engineering Technician Occupations* range from \$34.33 to \$34.78 (Exhibit 3a). On average, the median hourly earnings for *Engineering Technician Occupations* is \$34.56; this is more than the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 3b).<sup>4</sup>

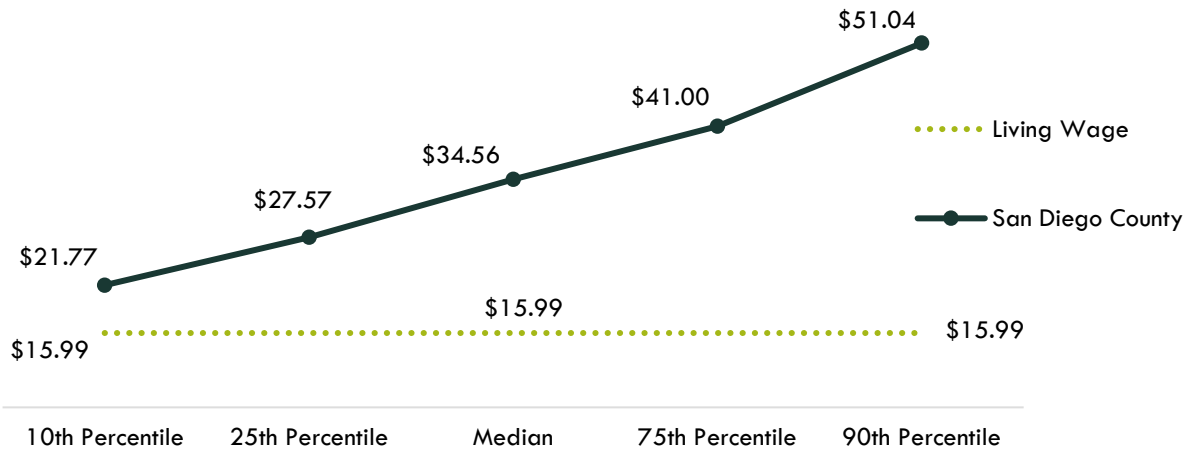
**Exhibit 3a: Hourly Earnings for Engineering Technician Occupations in San Diego County**

Occupational Title	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Industrial Engineering Technicians	\$28.42	\$34.33	\$38.98
Engineering Technicians, Except Drafters, All Other	\$26.72	\$34.78	\$43.01

<sup>3</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2018.

<sup>4</sup> "California Family Needs Calculator (formerly the Self-Sufficiency Standard)," Insight: Center for Community Economic Development, last updated 2018. [insightccd.org/2018-self-sufficiency-standard](https://insightccd.org/2018-self-sufficiency-standard).

**Exhibit 3b: Hourly Earnings<sup>5</sup> for Engineering Technician Occupations in San Diego County<sup>6</sup>**



## Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.<sup>7</sup> There are **eight** TOP codes and **19** CIP codes related to *Engineering Technician Occupations* (Exhibit 4).

**Exhibit 4: Related TOP and CIP Codes for Engineering Technician Occupations**

<i>Engineering Technician Occupations</i>
TOP 051000: Logistics and Materials Transportation
TOP 092400: Engineering Technology, General
TOP 093420: Industrial Electronics
TOP 093480: Laser and Optical Technology
TOP 094300: Instrumentation Technology
TOP 095420: Plastics and Composites
TOP 095600: Manufacturing and Industrial Technology
TOP 099900: Other Engineering and Related Industrial Technologies
CIP 15.0000: Engineering Technology, General
CIP 15.0201: Civil Engineering Technology/Technician

<sup>5</sup> 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

<sup>6</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

<sup>7</sup> TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).

### Engineering Technician Occupations

CIP 15.0304: Laser and Optical Technology/Technician

CIP 15.0404: Instrumentation Technology/Technician

CIP 15.0405: Robotics Technology/Technician

CIP 15.0406: Automation Engineer Technology/Technician

CIP 15.0607: Plastics and Polymer Engineering Technology/Technician

CIP 15.0611: Metallurgical Technology/Technician

CIP 15.0612: Industrial Technology/Technician

CIP 15.0613: Manufacturing Engineering Technology/Technician

CIP 15.0699: Industrial Production Technologies/Technicians, Other

CIP 15.0803: Automotive Engineering Technology/Technician

CIP 15.0805: Mechanical Engineering/Mechanical Technology/Technician

CIP 15.9999: Engineering Technologies and Engineering-Related Fields, Other

CIP 47.0105: Industrial Electronics Technology/Technician

CIP 49.9999: Transportation and Materials Moving, Other

CIP 50.0404: Industrial and Product Design

CIP 52.0203: Logistics, Materials, and Supply Chain Management

CIP 52.0410: Traffic, Customs, and Transportation Clerk/Technician

According to TOP data, **three** community colleges supply the region with awards for this occupation: **San Diego City College, San Diego Continuing Education, and Southwestern College**. According to CIP data, **one** non-community college supplies the region with awards: **National University** (Exhibit 5). San Diego Continuing Education has an Electronic Technician program<sup>8</sup> and MiraCosta College has an Engineering Technician program,<sup>9</sup> but no awards were reported.

<sup>8</sup> "Electronics: Electronic Technician," San Diego Continuing Education. [sdce.edu/job-training/electronics](http://sdce.edu/job-training/electronics).

<sup>9</sup> "Engineering Technician Program," MiraCosta College. [tci.miracosta.edu/courses-engineering-tech.html](http://tci.miracosta.edu/courses-engineering-tech.html).

**Exhibit 5: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions  
(Program Year 2013-14 through PY2016-17 Average)**

TOP6 or CIP	TOP6 or CIP Title	3-Yr Annual Average CC Awards (PY14-15 to PY16-17)	Other Educational Institutions 3-Yr Annual Average Awards (PY13-14 to PY15-16)	3-Yr Total Average Supply (PY13-14 to PY16-17)
051000	Logistics and Materials Transportation	<b>4</b>	<b>0</b>	<b>4</b>
	• Southwestern	4	0	
095600	Manufacturing and Industrial Technology	<b>8</b>	<b>0</b>	<b>8</b>
	• San Diego Cont Ed	0	0	
	• San Diego City	8	0	
099900	Other Engineering and Related Industrial Technologies	<b>4</b>	<b>0</b>	<b>4</b>
	• San Diego City	4	0	
15.0000	Engineering Technology, General	<b>0</b>	<b>1</b>	<b>1</b>
	• National University	0	1	
			<b>Total</b>	<b>17</b>

## Demand vs. Supply

Comparing labor demand (annual openings) with labor supply<sup>10</sup> suggests that there is a **supply gap** for these occupations in San Diego County, with **259** annual openings and **17** awards. Comparatively, there are **1,522** annual openings in California and **1,278** awards<sup>11</sup> (Exhibit 6).

### Exhibit 6: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

Community Colleges and Other Postsecondary Educational Institutions	Demand (Annual Openings)	Supply (Total Annual Average Supply)	Supply Gap or <b>Oversupply</b>
San Diego	259	17	<b>242</b>
California	1,522	1,278	<b>244</b>

<sup>10</sup> Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

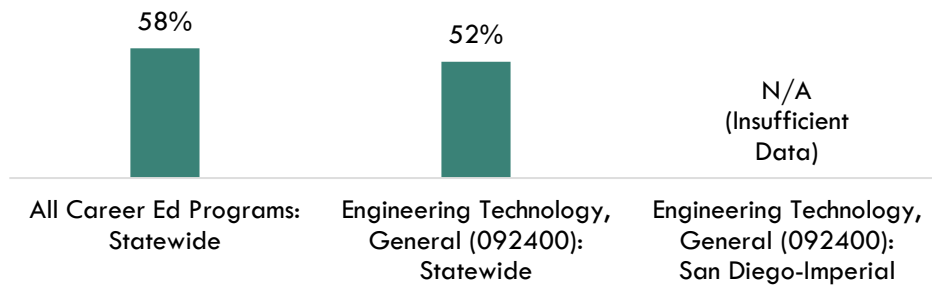
<sup>11</sup> "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/Supply-and-Demand.aspx.

**Please note:** This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

## Student Outcomes and Regional Comparisons

According to the California Community Colleges LaunchBoard, there was insufficient data to calculate the “Percentage of Students Employed in a Job Closely Related to Field of Study” in the San Diego-Imperial region and across the state for Engineering Technology, General (092400); however, there was data for the “Proportion of Students Who Earned a Living Wage.” Statewide, 52 percent of students earned a living wage after completing Engineering Technology, General (092400) programs, compared to 58 percent of students who earned a living wage after completing Career Education programs in general (Exhibit 7).

**Exhibit 7: Proportion of Students Who Earned a Living Wage, PY2015-16<sup>12</sup>**



## Top Employers and Work Locations

Between January 1, 2016 and December 31, 2018, the top five employers in San Diego County for these occupations were [Epsilon Systems Solutions](#), [Northrop Grumman](#), [General Atomics](#), [Illumina](#) and [ATK](#) (Exhibit 8).

<sup>12</sup> Among completers and skills builders who exited, the proportion of students who attained a living wage.



**Exhibit 8: Top Employers in San Diego County for Engineering Technician Occupations<sup>13</sup>**

Top Employers	
<ul style="list-style-type: none"> <li>• Epsilon Systems Solutions Incorporated</li> <li>• Northrop Grumman</li> <li>• General Atomics</li> <li>• Illumina Incorporated</li> <li>• ATK</li> </ul>	<ul style="list-style-type: none"> <li>• AECOM Technology Corporation</li> <li>• Danaher Corporation</li> <li>• General Dynamics</li> <li>• Thermo Fisher Scientific Inc.</li> <li>• US Navy</li> </ul>

**Skills, Education, and Certifications**

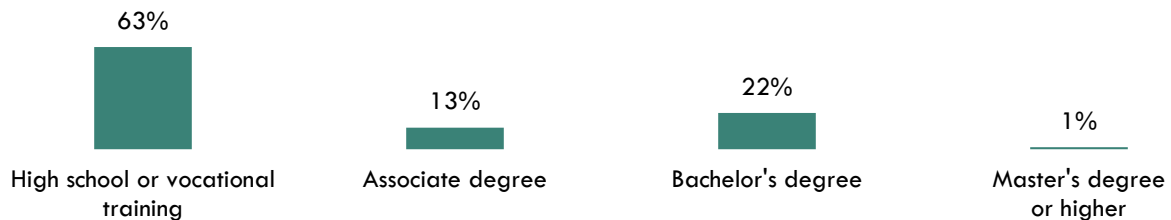
Engineering Technician Occupations have a national educational requirement of an [associate degree](#) (Exhibit 9a).

**Exhibit 9a: National Educational Attainment for Engineering Technician Occupations<sup>14</sup>**

Occupational Title	Typical Entry-Level Education
Industrial Engineering Technicians	Associate degree
Engineering Technicians, Except Drafters, All Other	Associate degree

Based on online job postings between January 1, 2016 and December 31, 2018, the top listed educational requirement for Engineering Technician Occupations is a [high school or vocational training](#) (Exhibit 9b).<sup>15</sup>

**Exhibit 9b: Educational Requirements for Engineering Technician Occupations in San Diego County<sup>16</sup>**



\*May not add to 100% due to rounding.

<sup>13</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.

<sup>14</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

<sup>15</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.

<sup>16</sup> "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified October 18, 2018. [bls.gov/emp/tables/educational-attainment.htm](https://bls.gov/emp/tables/educational-attainment.htm).

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2016 and December 31, 2018.

**Exhibit 10: Top Skills for Engineering Technician Occupations in San Diego County<sup>17</sup>**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> <li>• Repair</li> <li>• Good Manufacturing Practices</li> <li>• Scheduling</li> <li>• Test Equipment</li> <li>• Packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Troubleshooting</li> <li>• Communication Skills</li> <li>• Physical Abilities</li> <li>• Computer Literacy</li> <li>• Detail-Oriented</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft Excel</li> <li>• Microsoft Word</li> <li>• Microsoft PowerPoint</li> <li>• Linux</li> <li>• Microsoft Windows</li> </ul>

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**Important Disclaimers**

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor’s Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

<sup>17</sup> Burning Glass Technologies, “Labor Insight Real-Time Labor Market Information Tool.” 2016-2018.