

QUALITY IN MANUFACTURING

San Diego and
Imperial Counties



COMMUNITY COLLEGES

SAN DIEGO & IMPERIAL COUNTIES

CAREER EDUCATION

NEW FOCUS ON QUALITY IN MANUFACTURING

Explores the **demands of industry** for Quality Career in Manufacturing

Illustrates the **opportunities** that community colleges in San Diego and Imperial Counties have to meet the workforce needs



Quality is Key in Manufacturing Organizations



What is Quality? And how do we fit in?

Quality Control

- Product focused
- Inspections
- Verify Quality
- Detection of defects
- Statistical Process Control
- Raw Material Control

Quality Assurance

- Process focused
- Audits
- Manages Quality
- Prevention of defects
- Document Control
- Risk Management



Industry Needs / Labor Market Demands



**INSPECTORS, TESTERS, SORTERS,
SAMPLERS AND WEIGHERS (SOC 51-
9061)**



**QUALITY CONTROL ANALYSTS (SOC 19-
4099.01):**

Inspectors, Testers, Sorters, Samplers and Weighers (SOC 51-9061)

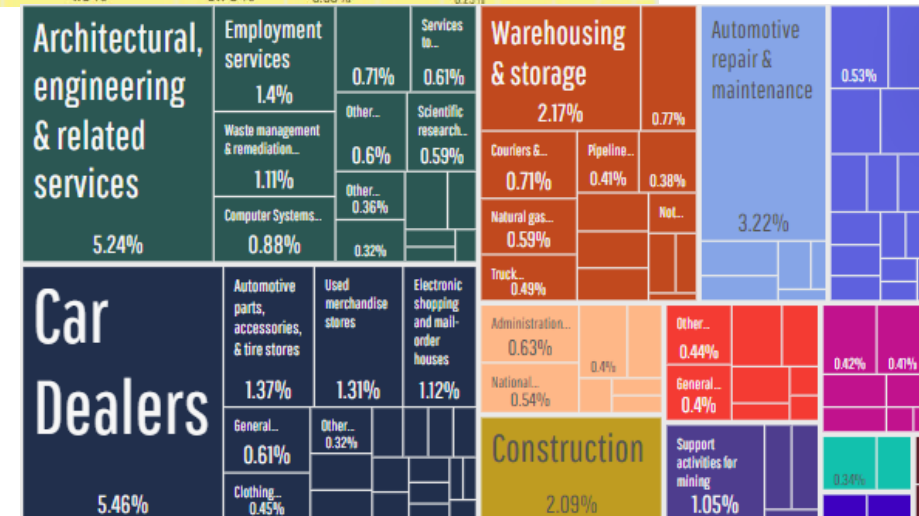
Sample Job Titles:

Inspector, QA Auditor (Quality Assurance Auditor), QA Inspector (Quality Assurance Inspector), QA Technician (Quality Assurance Technician), QC Technician (Quality Control Technician), Quality Auditor, Quality Control Inspector (QC Inspector), Quality Inspector, Quality Technician, Test Technician

Sectors ([DATAUSA.IO](https://datausa.io), 2022):

Manufacturing, Architecture, Engineering, Aviation & Automotive, Pipeline transportation, Electric Power Generation, Transmission & Distribution

Motor vehicles & motor vehicle equipment manufacturing 7.17%	Electronic component & product manufacturing, n.e.c. 2.35%	Machine shops; turned product; screw, nut & bolt manufacturing 1.44%	Not specified manufacturing industries 1.43%	Electric lighting & electrical equipment... 1.25%	1.22%	1.09%	1.02%	Iron & steel mills & steel product...
	Machinery manufacturing, n.e.c. or not specified 2.15%	Furniture & related product... 0.99%	Printing & related... 0.75%	Fabric mills... 0.51%	Cut and sew... 0.51%	Tire... 0.5%	0.5%	
Aircraft & parts manufacturing 3.99%	Plastics product manufacturing 2.08%	Fruit & vegetable preserving &... 0.89%	Resin... 0.66%	Ship & boat... 0.45%				
	Animal slaughtering & processing 1.65%	Navigational, measuring... 0.87%	Industrial &... 0.62%	Textile... 0.33%	0.26%			
Medical equipment & supplies manufacturing 2.84%	Pharmaceutical & medicine manufacturing 1.5%	Structural metals, & boiler, tank, &... 0.86%	Construction, &... 0.6%	Engine... 0.3%	0.26%			
		Seafood & other... 0.76%	Glass & glass... 0.58%	Coaling... 0.28%	0.25%			
			Petroleum... 0.53%	Metal... 0.25%				



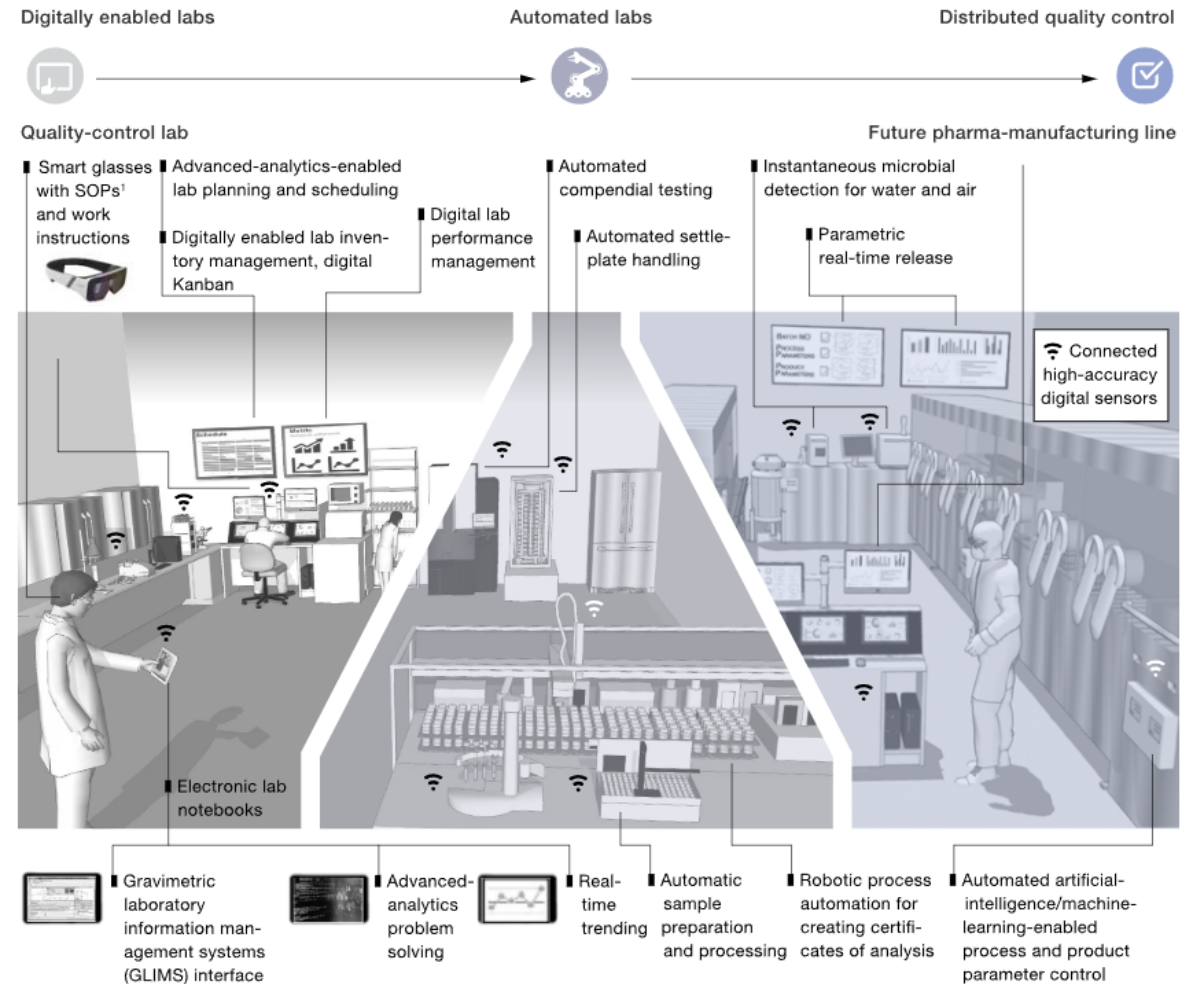
Quality Control Analysts (SOC 19-4099.01)

Sample Job Titles:

Lab Analyst, Lab Technician (Lab Tech), Laboratory Analyst, Microbiology Lab Analyst, QA Auditor (Quality Assurance Auditor), QA Lab Tech (Quality Assurance Lab Technician), QA Tech (Quality Assurance Technician), Quality Control Analyst (QC Analyst), Quality Control Lab Technician (QC Lab Tech), Quality Control Technician (QC Tech)

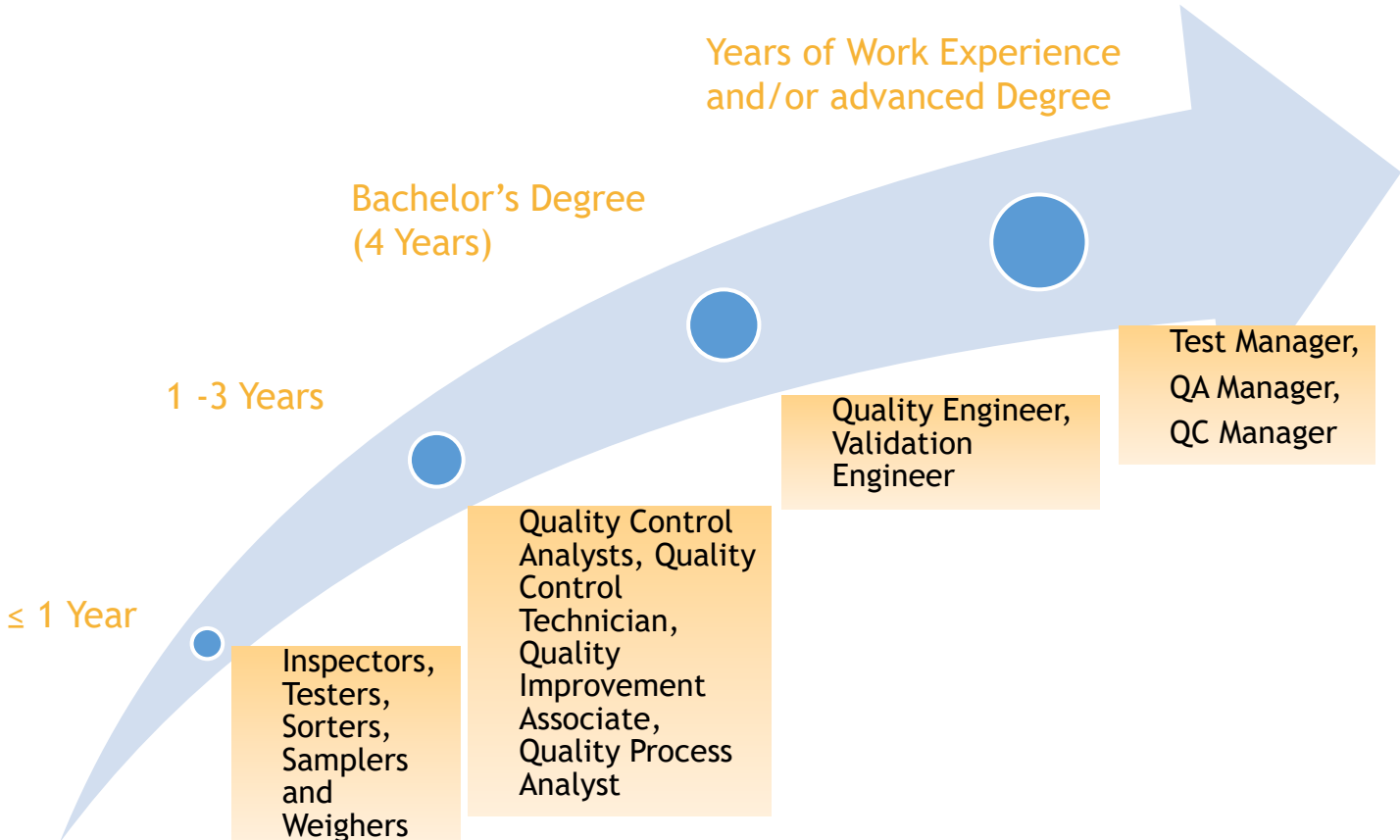
Sectors:

Manufacturing, Biotech/Life Sciences Retail, Hospitality & Tourism, Agriculture, Forestry, Fishing and Hunting, Construction



Source: McKinsey. (2019). Digitization, automation, and online testing: The future of pharma quality control. Retrieved from: <https://www.mckinsey.com/industries/life-sciences/our-insights/digitization-automation-and-online-testing-the-future-of-pharma-quality-control#:~:text=In%20the%20future%2C%20artificial%20intelligence,in%20our%20continuous%2Dimprovement%20journey.>

Career Pathway



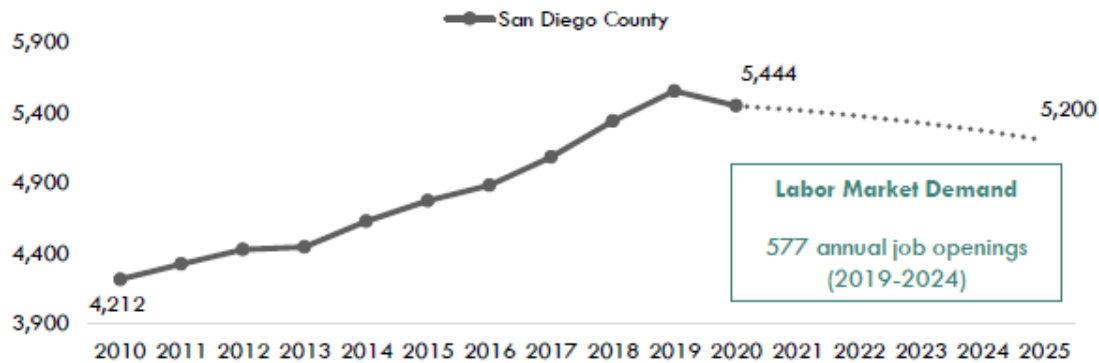
- High school diploma/GED
- Career change
- Lateral move within company

Projected Demand

Projected Occupational Demand

Between 2020 and 2025, *Inspectors, Testers, Sorters, Samplers, and Weighers* are projected to decrease by 244 net jobs or four percent (Exhibit 1). Employers in San Diego County will need to hire 577 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

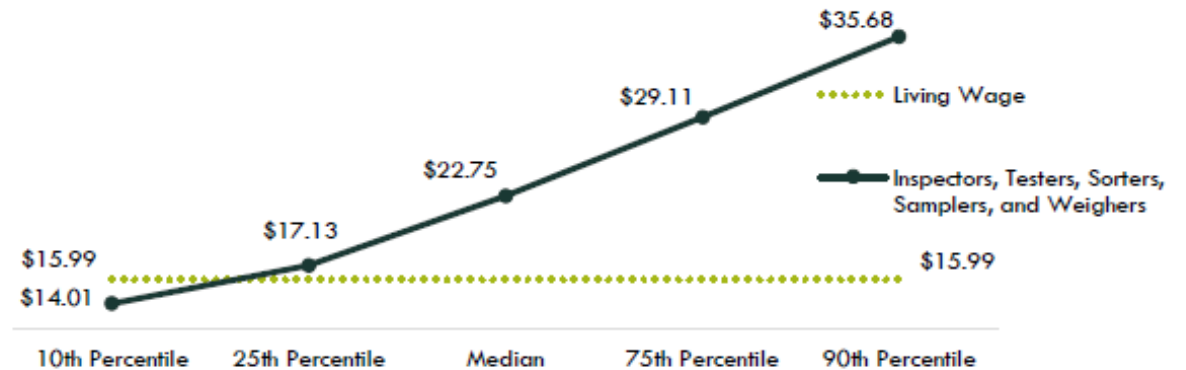
Exhibit 1: Number of Jobs for *Inspectors, Testers, Sorters, Samplers, and Weighers* (2010-2025)³



Earnings

Inspectors, Testers, Sorters, Samplers, and Weighers receive entry-level hourly earnings of \$17.13; this is more than the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 2).⁴

Exhibit 2: Hourly Earnings⁵ for *Inspectors, Testers, Sorters, Samplers, and Weighers* in San Diego County⁶



Current Supply

Exhibit 5: 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 Oversupply
San Diego	577	205	372
California	6,270	1,356	4,914

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.

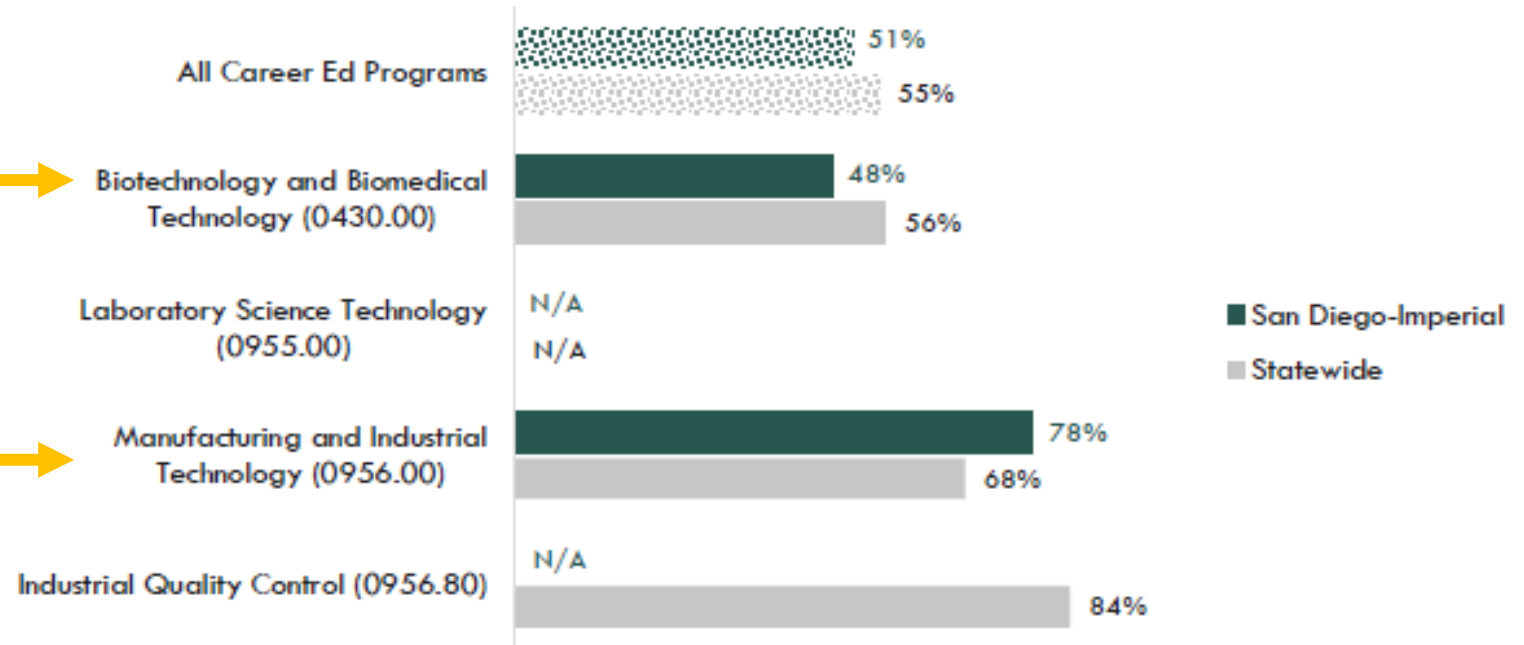
Current Student Outcomes & Regional Comparisons (1 of 2)

Exhibit 6a: Proportion of Students Who Earned a Living Wage by Program, PY2017-18¹⁰

MiraCosta College, Mesa,
Miramar, Southwestern
(Biotechnology & Biomedical)



San Diego City College



"N/A" indicates insufficient data

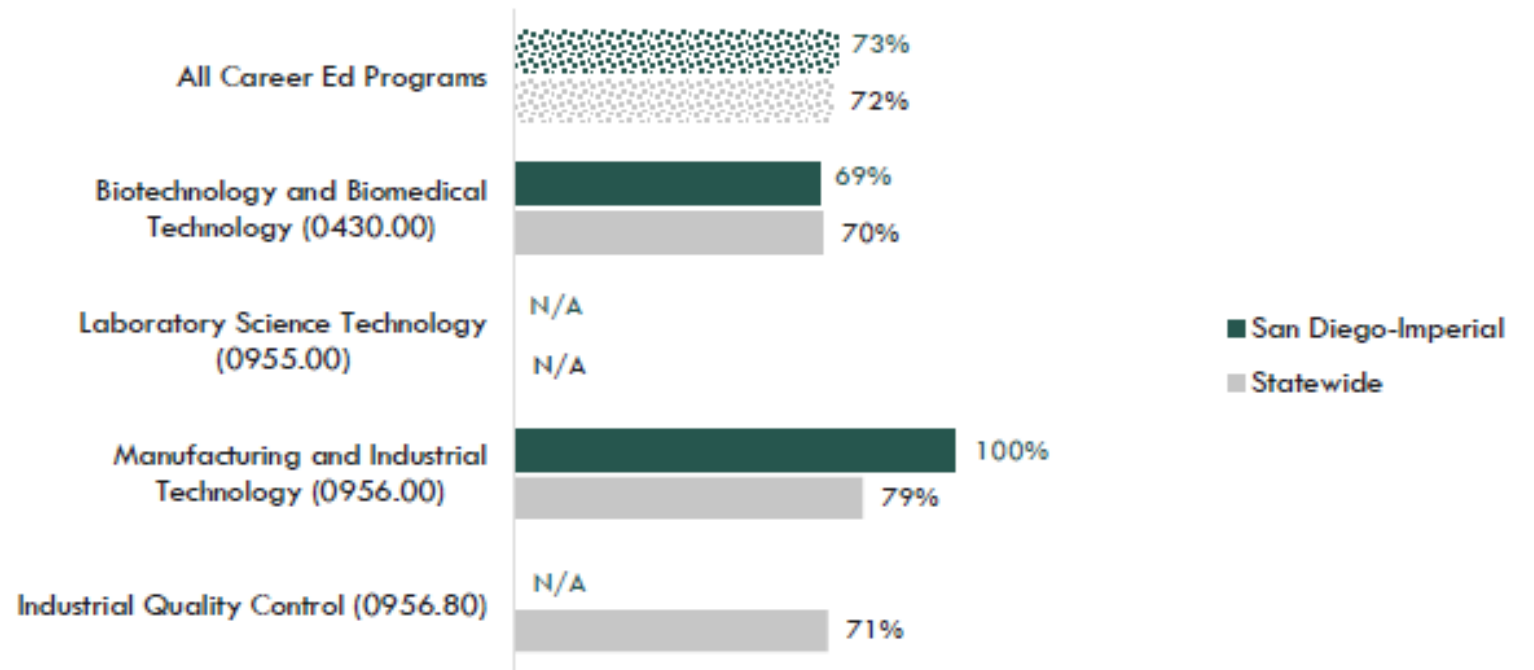
Current Student Outcomes & Regional Comparisons (2 of 2)

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2016-17¹¹

MiraCosta College, Mesa,
Miramar, Southwestern
(Biotechnology & Biomedical)



San Diego City College



¹¹"N/A" indicates insufficient data

Trends and Earnings for Quality Control Analysts

Exhibit 7b: Number of Online Job Postings for Quality Control Analysts within “Health Care” and “Manufacturing” Industries in San Diego County (2010-2020)

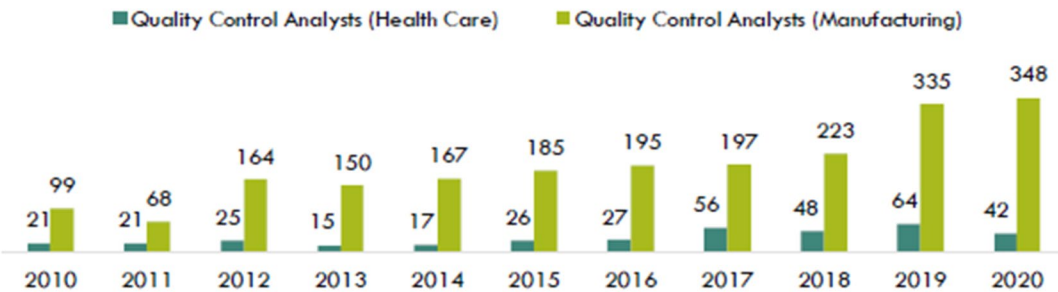


Exhibit 9: Number of Online Job Postings for Quality Control Analysts by Industry in San Diego County¹³

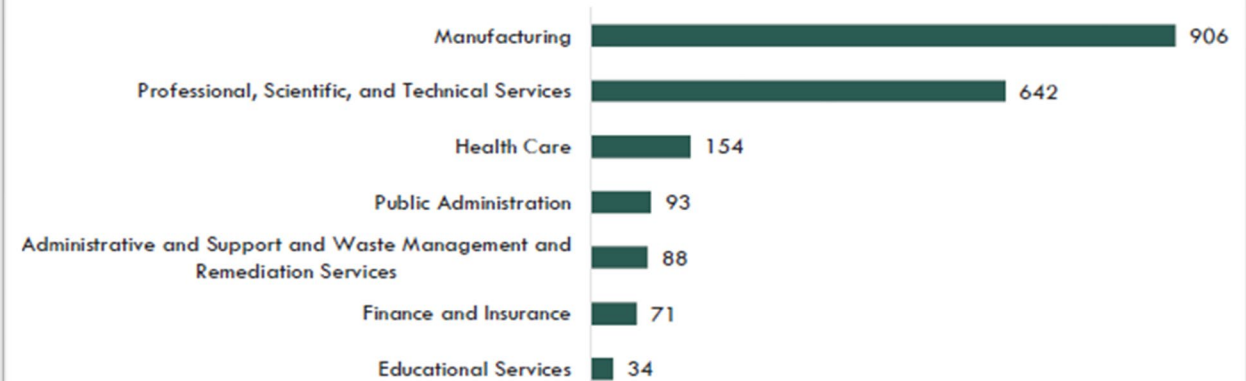


Exhibit 13: Hourly Earnings for Quality Control Analysts and Quality Control Analysts within “Health Care” and “Manufacturing” industries in San Diego County¹⁸

Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Quality Control Analysts (Health Care)	\$20.87	\$24.74	\$32.14
Quality Control Analysts	\$19.11	\$23.42	\$30.15
Quality Control Analysts (Manufacturing)	\$18.14	\$21.40	\$28.85

Source: Center of Excellence for Labor Market Research (2021). Inspectors, Testers, Sorters, Samplers, and Weighers (Including Quality Control Analysts), Labor Market Analysis: San Diego County. Retrieved from: <https://coecc.net/san-diego-imperial/2021/04/inspectors-testers-sorters-samplers-and-weighers-including-quality-control-analysts/>

Top Skills

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none">• Quality Assurance and Control• Quality Management• Good Manufacturing Practices• Chemistry• Batch Records• Biology• Calibration• Biotechnology• Good Laboratory Practices• Packaging• Data Analysis• Scheduling• Biochemistry• Data Entry• Internal Auditing	<ul style="list-style-type: none">• Communication Skills• Detail-Oriented• Organizational Skills• Problem Solving• Microsoft Word• Teamwork / Collaboration• Writing• Computer Literacy• Physical Abilities• Written Communication• Troubleshooting• Planning• Multi-Tasking• Verbal / Oral Communication• English	<ul style="list-style-type: none">• Microsoft Excel• Microsoft Word• Microsoft PowerPoint• Word Processing• Enterprise Resource Planning• Microsoft Outlook• SAP• Microsoft Access• Microsoft Visio• Microsoft SharePoint• Adobe Acrobat• Salesforce• Microsoft Project• Software Engineering• Adobe Photoshop

Top Certifications in Online Job Postings

- Security Clearance
- American Society For Quality (ASQ) Certification
- Certified Quality Auditor (CQA)
- IPC Certification
- OSHA Safety 10 Hour
- Six Sigma Green Belt Certification
- Certified Quality Engineer (CQE)
- Auditor Certification
- Certified Quality Technician (CQT)
- Certified Outpatient Coding (COC)
- Certified Quality Improvement Associate (CQIA)
- Six Sigma Black Belt Certification
- Hazard Analysis and Critical Control Point (HACCP) Certification
- Project Management Certification
- Certified Manager of Quality Organizational Excellence (CMQ/OE)

Types of careers in both QC and QA (per [ASQ](#))

Job Title	Foundational Quality & Inspector/Technician			Six Sigma	Comments
	Introductory	Intermediate	Advanced		
Calibration Technician		X			5 Years of on-the-job experience in one or more areas of the Certified Calibration Technician Body of Knowledge. 2 Years waived for Associates Degree
Quality Inspector	X				2 Years of work experience in mechanical inspection or a related field, or successful completion of an *ASQ-approved accredited technical/apprenticeship training course. If you do not have a high-school diploma or GED, you must have three additional years of work experience.
Quality Technician		X			4 Years of on-the-job experience in one or more of the areas of the Certified Quality Technician Body of Knowledge.
Quality Engineer			X		For colleges that already have foundational quality programs
Yellow Belt	X			X	The Certified Six Sigma Yellow Belt has no experience or education requirements. The Certified Six Sigma Yellow Belt is aimed at candidates who have a small role, interest, or need to develop foundational knowledge.
Green Belt		X		X	3 Years of on-the-job experience in one or more of the areas of the Certified Six Sigma Green Belt Body of Knowledge.
Black Belt			X	X	Experienced
Master Black Belt			X	X	Experienced
Quality Improvement Associate		X			2 Years of work experience, or an associate degree or two years of equivalent higher education.
Quality Process Analyst		X			2 Years of on-the-job experience in one or more of the areas of the CQPA, or an associate degree or two years of equivalent higher education.

Knowledge, Skills & Abilities

Certified Quality Inspector

- Technical Mathematics
- Metrology
- Inspection and Test
- Quality Assurance

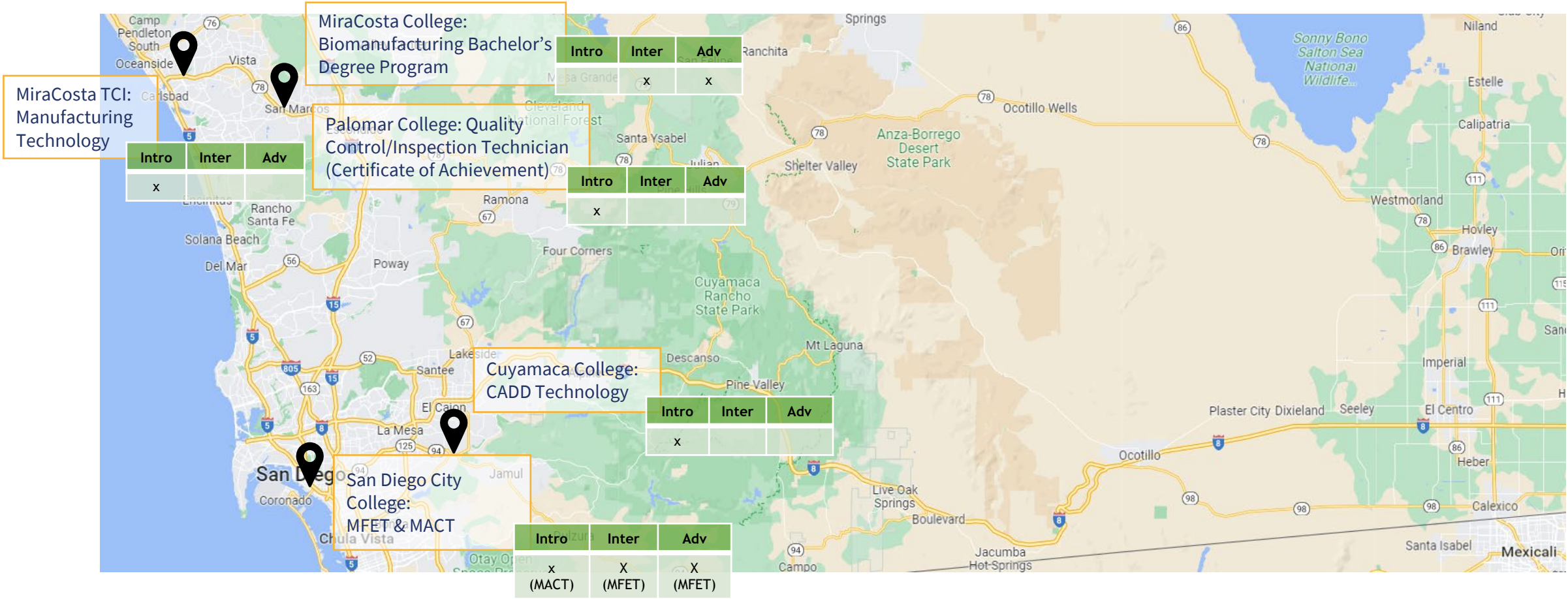
Certified Quality Technician

- Quality Concepts
- Statistical Techniques
- Metrology and Calibration
- Inspection and Test
- Quality Audits
- Risk Management

Yellow Belt

- Six sigma foundations and principles
- Define Phase
- Measure Phase
- Analyze Phase
- Improve and Control Phases

Colleges that have Quality-related Programs



Recommendations and Next Steps

- For colleges that have new manufacturing program or manufacturing programs that have no quality-related courses, introduce certifications in
 - [ASQ Certified Quality Inspector Body of Knowledge Handbook](#), and/or
 - [ASQ Certified Six Sigma Yellow Belt](#)
- Upgrade program from introductory to intermediate, and then advanced.



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THANK YOU



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