

Sector Strategies: Problem Statements and Possible Interventions

2020- 2021

This document provides an overview of the labor market challenges in our region’s Priority and Emerging Sectors—specifically those addressable by the San Diego and Imperial Counties Community Colleges. These problem statements and their possible interventions were crafted by the San Diego-Imperial Center of Excellence for Labor Market Research (COE) and the sectors’ respective Regional Directors for Employer Engagement (Regional Directors).

1) HEALTH

Problem Statement

More than 15 educational institutions in the San Diego-Imperial region train for key health care positions such as *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants*. While there is a significant labor market supply gap for these occupations (a gap of approximately 1,019 job openings to be filled each year), their entry-level earnings are below the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 1).¹ Furthermore, with the exception of *Medical Assistants*, their median hourly earnings are also below the living wage.

Exhibit 1: Hourly Earnings by Occupation in San Diego County

Occupational Title	Entry-Level Hourly Earnings	Median Hourly Earnings
Home Health Aides	\$12.16	\$13.83
Medical Assistants	\$15.69	\$17.88
Nursing Assistants	\$13.58	\$15.61

Yet six community colleges in the region offer training programs for *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants*. These occupations are typically considered “pathway occupations” to higher paying health care positions such as *Licensed Vocational Nurses* or *Registered Nurses*. However, due to the limited number of clinical placement opportunities in the region (and throughout California), students have fewer opportunities to follow these traditional career pathways. As a result, there is a need for an alternative pathway for students in programs for *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants* and for existing workers in these positions.

¹ San Diego-Imperial Center of Excellence for Labor Market Research. *Sector Recommendation Brief: Health Care*. 2020.

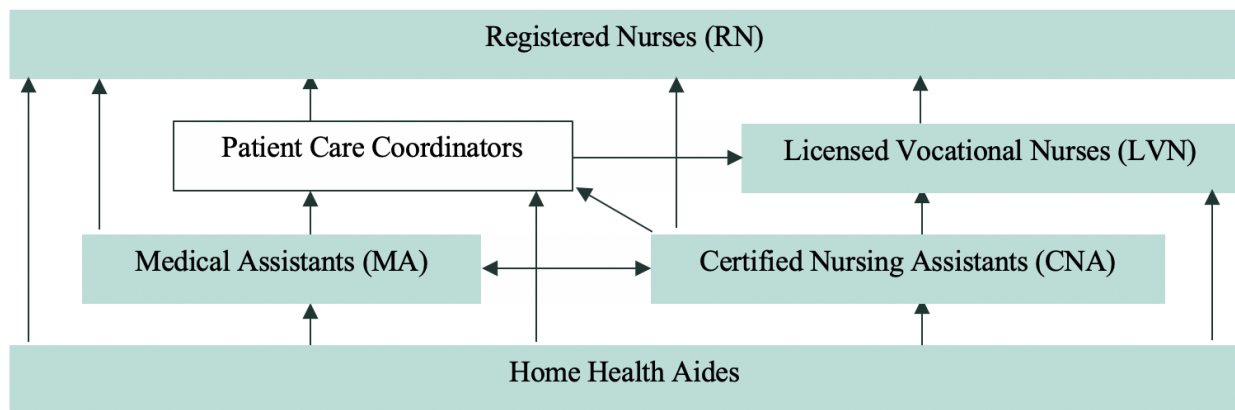
Possible Intervention: Expand Existing Programs to Include Patient Care Coordinators

Targeted colleges:

- Grossmont College
- Imperial Valley College
- MiraCosta College
- Palomar College
- San Diego Mesa College
- Southwestern College
- San Diego Continuing Education

After consulting employers, hosting focus groups, and analyzing online job postings, the COE and Regional Director recommend that colleges with programs for *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants* consider a career pathway for *Patient Care Coordinators*: Exhibit 2 provides a simplified career pathway diagram that includes *Patient Care Coordinators* as a potential next step for these positions.²

Exhibit 2: Simplified Career Pathway Diagram for *Patient Care Coordinators*



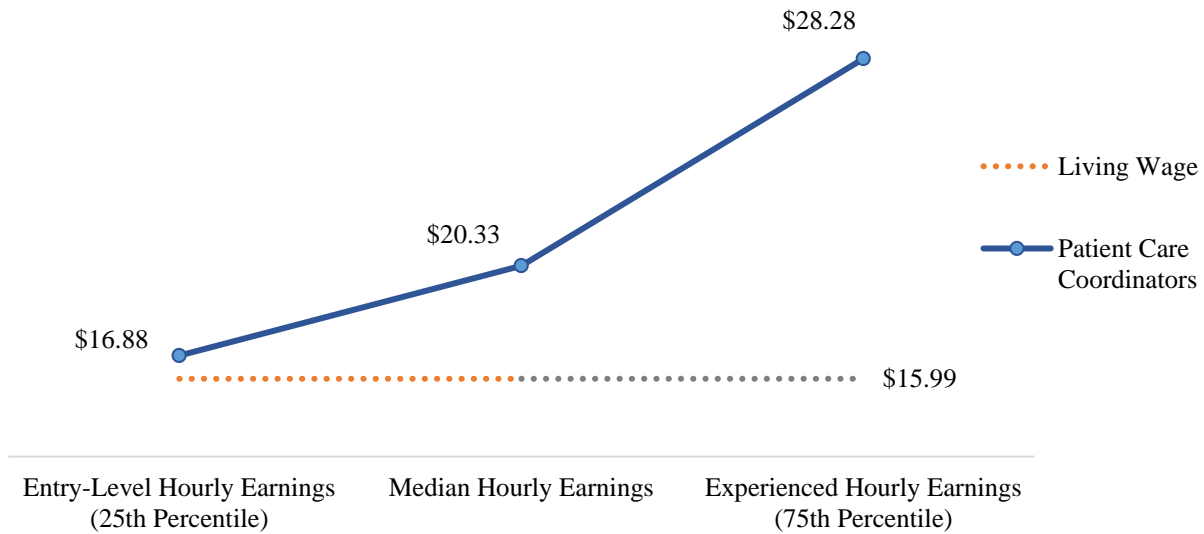
Patient Care Coordinators assess a patient’s “physical, social, psychological, and financial needs. They are often the first contact for provision of information to the patient or physician on behalf of attending physicians.”³ According to available labor market information, entry-level and median hourly wages for *Patient Care Coordinators* are \$16.88 and \$20.33, respectively—both are higher than the living wage (Exhibit 3).

² A more elaborate career pathway diagram is available in the full report: San Diego-Imperial Center of Excellence for Labor Market Research. *Sector Recommendation Brief: Health Care*. 2020.

³ healthcareersinfo.net/patient-care-coordinators

Additionally, employers posted more online job postings for *Patient Care Coordinators* in 2019 than in 2017, suggesting that there is an increased labor market demand for *Patient Care Coordinators* in the region.⁴

Exhibit 3: Hourly Earnings⁵ for *Patient Care Coordinators* in San Diego County, 2019⁶



Based on the knowledge, skills and abilities listed in those online job postings, **the region’s community colleges could offer the following courses for a *Patient Care Coordinators* program (Exhibit 4).** (If these courses currently exist, then the colleges could “repurpose” them for a *Patient Care Coordinators* program.)

⁴ Please keep in mind that online job postings are not as reliable as traditional labor market information. Employers tend to post more frequently for occupations that they have difficulty filling, which can result in overestimated numbers for online job postings.

⁵ 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.

⁶ Burning Glass Technologies, “Labor Insight Real-Time Labor Market Information Tool.” 2019.

Exhibit 4: Potential Courses for *Patient Care Coordinators*

Prospective Course Title	Description
Introduction to Public Health / Social Determinants of Health	<ul style="list-style-type: none">• Identify social determinants of health that affect chronic diseases
Motivational Interviewing	<ul style="list-style-type: none">• Assist with behavioral change to set goals toward a healthier life style• Identify unhealthy behaviors
Chronic Diseases and Management of Chronic Conditions	<ul style="list-style-type: none">• Learn about chronic health issues, environmental conditions, mental health challenges (e.g., stress, anxiety, fear), etc.
Health Care System	<ul style="list-style-type: none">• Understand private health care, Medical, Medicare, and other programs that exist• Understand billing, coding, etc.• Navigate the health care system to make better referrals
Cultural Competency and Patient Advocacy (Communication Skills)	<ul style="list-style-type: none">• Develop critical thinking skills to resolve problems between patients and providers• Learn verbal and written communication skills specific to the health care sector• Learn how to communicate with people from different backgrounds and how to advocate on behalf of people from different cultures
Organizational Skills and Computer Skills	<ul style="list-style-type: none">• Develop Microsoft Office Suite skills (e.g., Microsoft Word, Microsoft Excel, Microsoft Outlook)

2) ADVANCED MANUFACTURING

Problem Statement

Now more than ever, companies need industrial automation to be resilient in the post-pandemic world.⁷ *Industrial Automation Careers* deal with automation, robotics, and mechatronics. As the use of robots increases in manufacturing production and distribution, employers will need professionals who can work with, train and troubleshoot robots.⁸

Between 2019 and 2024, *Industrial Automation Careers* are projected to increase by 992 net jobs or four percent in San Diego County⁹ and 36 net jobs or four percent in Imperial County¹⁰. Not only are they in demand, *Industrial Automation Careers*’ entry-level and median earnings are above the living wage (Exhibit 5) and employers typically require an associate degree for these positions, making them an excellent fit for the San Diego and Imperial Counties Community Colleges to provide training.

Exhibit 5: Hourly Earnings for *Industrial Automation Careers* in San Diego County¹¹

Occupational Title	Entry-level Hourly Earnings (25 th Percentile)	Median Hourly Earnings
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	\$43.36	\$53.03
Industrial Engineering Technicians	\$28.30	\$34.27
Electrical and Electronics Repairers, Commercial and Industrial Equipment	\$26.80	\$30.90
Electrical and Electronics Engineering Technicians	\$26.34	\$33.14
Electrical and Electronics Installers and Repairers, Transportation Equipment	\$24.68	\$27.50
Industrial Machinery Mechanics	\$23.25	\$27.82
Electro-Mechanical Technicians	\$21.96	\$28.52
Mechanical Engineering Technicians	\$20.40	\$26.96
Installation, Maintenance, and Repair Workers, All Other	\$16.47	\$20.59
Maintenance and Repair Workers, General	\$15.86	\$19.78

⁷ [bcg.com/industries/engineered-products-infrastructure/center-digital-machinery/default](https://www.bcg.com/industries/engineered-products-infrastructure/center-digital-machinery/default)

⁸ www2.deloitte.com/us/en/pages/manufacturing/articles/future-of-manufacturing-skills-gap-study.html

⁹ coeccc.net/reports/Industrial_Automation_Occupations

¹⁰ coeccc.net/reports/Industrial_Automation_Occupations_Imperial_County

¹¹ Imperial County-specific wages could be found at coeccc.net/reports/Industrial_Automation_Occupations_Imperial_County

Possible Intervention: Expand Existing Programs to Include Skills and Competencies Required in Industrial Automation Careers

Targeted colleges:

- Cuyamaca College
- Grossmont College
- MiraCosta College
- Imperial Valley College
- Palomar College
- San Diego City College
- San Diego Continuing Education
- Southwestern College

Comparing labor market demand with supply, the San Diego-Imperial COE found a supply gap of 2,461 awards for San Diego County¹² and 47 for Imperial County¹³. In order to address the supply gap for these occupations, **the region’s community colleges could implement an *Industrial Automation and Maintenance Program***. This program will prepare students for fields such as engineering technology, electrical technology, industrial technology, operational technology, sensor technology, automation technology, robotics and mechatronics. This can be accomplished by expanding existing programs or creating new programs in the region. According to Taxonomy of Programs (TOP) data, four community colleges currently supply the region with awards for *Industrial Automation Careers* (Exhibit 6).

Exhibit 6: Colleges with Programs (TOP Codes) for *Industrial Automation Careers*

TOP Code and Title	College
0934.00 Electronics and Electric Technology	<ul style="list-style-type: none"> • Imperial Valley • San Diego City • San Diego Continuing Education
0934.10 Computer Electronics	<ul style="list-style-type: none"> • San Diego City • San Diego Continuing Education
0934.40 Electrical Systems and Power Transmission	<ul style="list-style-type: none"> • San Diego City
0935.00 Electro-Mechanical Technology	<ul style="list-style-type: none"> • Cuyamaca
0956.00 Manufacturing and Industrial Technology	<ul style="list-style-type: none"> • San Diego City • San Diego Continuing Education
0999.00 Other Engineering and Related Industrial Technologies	<ul style="list-style-type: none"> • San Diego City

¹² coeccc.net/reports/Industrial_Automation_Occupations

¹³ coeccc.net/reports/Industrial_Automation_Occupations_Imperial_County

Industrial Automation Careers generally require the following KSAs (Exhibit 7). At minimum, the San Diego and Imperial Counties Community Colleges should incorporate these KSAs into their existing programs.

Exhibit 7: Knowledge, Skills and Abilities for *Industrial Automation Careers*¹⁴

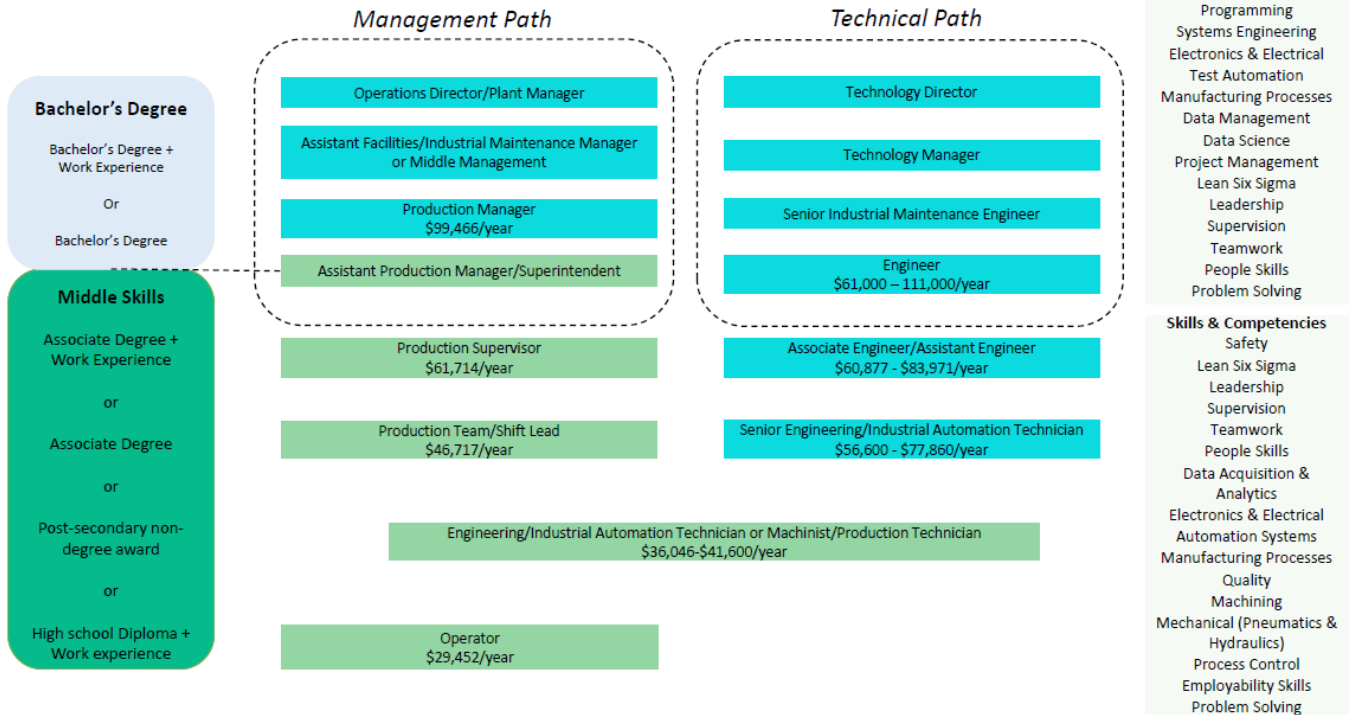
Data Acquisition & Analytics	Machining
Electronics & Electrical	Mechanical (Pneumatics & Hydraulics)
Automation Systems	Process Control
Manufacturing Processes	21st Century Employability Skills
Quality	

More specifically, *Industrial Automation Careers* have two types of career pathways that the community colleges could focus on: 1) Production and Operations and 2) Maintenance and Operations (Exhibit 8).

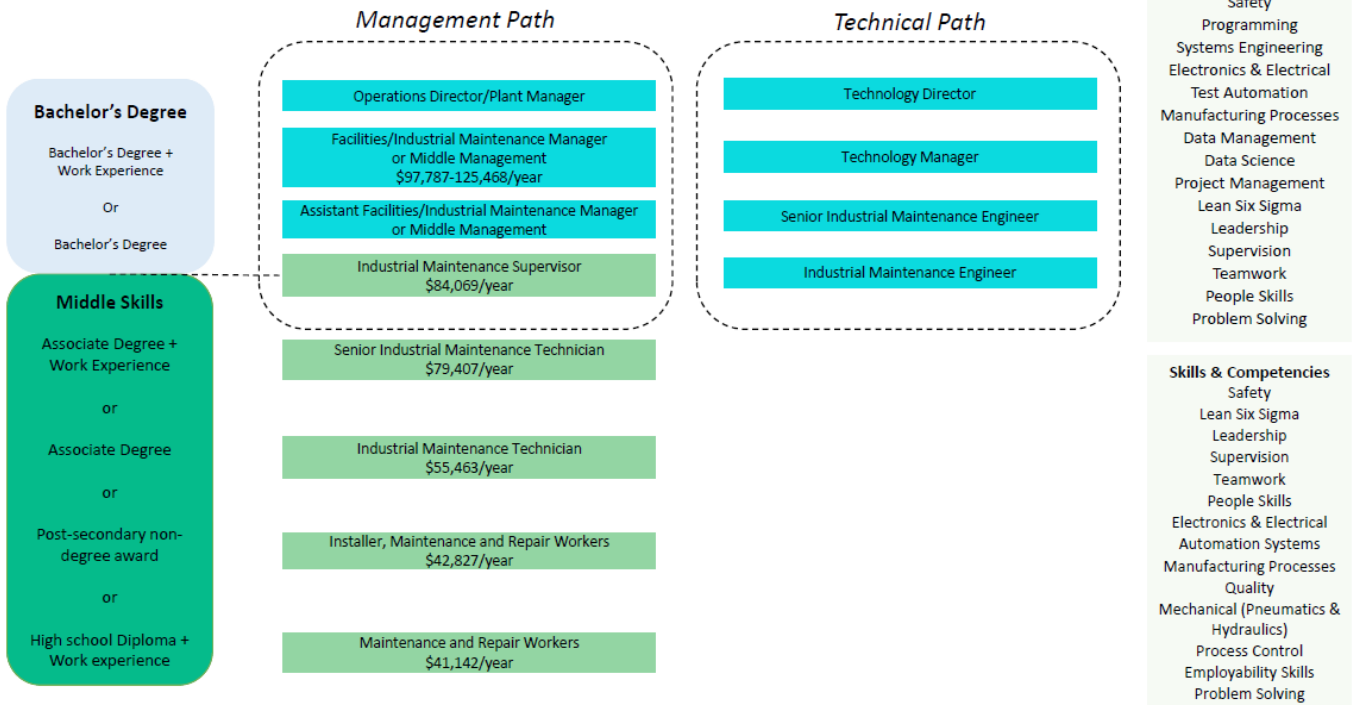
¹⁴ amatrol.com/wp-content/uploads/2020/02/CH-23-H-Advanced-Manufacturing-Chart-Interactive-PDF.pdf
coeccc.net/reports/Industrial_Automation_Occupations

Exhibit 8: Career Pathways for *Industrial Automation Careers*

Career Ladder - Production and Operations



Career Ladder - Maintenance and Operations



3) ICT & DIGITAL MEDIA

Problem Statement

There is significant labor market demand for ICT and Digital Media professionals, specifically in programming, systems administration/networking (“tech forest”)¹⁵, and cybersecurity¹⁶. These “behind-the-screen” positions pay well—in many cases, 2 to 4 times the living wage. However, challenges exist in training for “behind-the-screen” positions: Employers frequently require more than an associate degree to enter and/or advance in these fields and much attention has been paid to train workers in business software applications (termed “Business Information Worker” or BIW) and web development due to the ease in developing such programs. These “in-front-of-the-screen” opportunities represent about more than 75% of positions in this sector but tend to offer lower wages than “behind-the-screen” positions (Exhibit 9). Digital media salaries are negatively impacted by oversupply and data is convoluted as this skill set is increasingly becoming part of other job titles (i.e., content creation/editing may be required as part of a “graphics designer” position).

Exhibit 9: Hourly Earnings by Occupation in San Diego County¹⁷

Occupational Title	Sub-sector	Median Hourly Earnings
Information Security Analyst	Cybersecurity - behind	\$46.84
Computer User Support Specialist	“Tech forest” - behind	\$28.19
Web Developer	Programming - behind	\$26.39
Software Developers - Applications	Programming - behind	\$53.21
Secretaries and Administrative Assistants	Business software - front	\$19.66
Multimedia Artists and Animators	Digital media - front	\$26.40

The greatest opportunity, in terms of job quantity and earnings, exists in “behind-the-screen” professions. Software development (as part of Associate Degree for Transfer or ADT in Computer Science) or stand-alone is the largest unfulfilled need followed by cybersecurity.¹⁸ All colleges offer some programming courses but not all languages are equally in demand. A recent San Diego Regional EDC report, Demand for Software Talent, identified python, JavaScript, Java, SQL, C++, C# and C as high-demand languages (in addition to other skills such as version

¹⁵ coecc.net/reports/Information_Technology_Administrators and coecc.net/reports/Computer_User_Support_Specialists

¹⁶ coecc.net/reports/Information_Security_Analysts

¹⁷ EMSI 2020.02; QCEW, Non-QCEW, Self-Employed.

¹⁸ WestEd analysis of LaunchBoard and EMSI data estimates public regional community colleges will supply 14% of regional demand for software developers and 14% of networking/cybersecurity specialists (mid-college prep) over the next 3 years

control and agile methodology).¹⁹ Of note, Visual Basic, Ruby, PHP and Fortran are missing from this list but continue to be offered at several colleges to some degree.

All 10 public community colleges offer business software applications (BIW) and digital media programs, despite an overrepresentation of digital media and entertainment relative to job opportunities.

For cybersecurity, industry certifications are highly valued, perhaps more than university degrees. As such, the focus should be on courses and programs that cover similar, if not identical subject matter content as mainstream in-demand certifications from Cisco, CompTIA, EC-Council, ISACA and (ISC)² (Exhibit 10). For a clearer understanding of the knowledge, skills, and abilities needed for careers in ICT/DM, see Exhibit 11.

Exhibit 10: Major Industry Cybersecurity Certifications

Organization	Certification	Demand	
		Jobs ⁽¹⁾	Percent
CompTIA	Security+, CySA+, PenTest+, CASP+	2,325	79%
Cisco	CCNA, CCNP, CCIE	214	7%
(ISC) ²	CISSP, CCSP	154	5%
AXELOS	ITIL	98	3%
ISACA	CISA, CISM	90	3%
SANS	GIAC – (GSEC, GSNA, GICSP, GCIH, GCFA, GCED, GCIA)	33	1%
EC-Council	Certified Ethical Hacker (CEH), CHFI, ECSA	22	1%

¹⁹ arcgis.com/apps/Cascade/index.html?appid=36ef8f3e9881417f87edfeae537e66

Exhibit 11: Knowledge, Skills, Abilities for Success by Subsector

Business Software Applications	IT Networking/Cybersecurity	Computer Science / Software Development	Digital Media / Entertainment
Business Communications & Computer Literacy	A+ (or comparable hardware) (esp. retail)	CS-ADT	Graphic Design (Adobe - Photoshop, Illustrator, InDesign, Animate)
MS Office (Word, Powerpoint, Excel, Outlook)	Help desk / troubleshooting	C++, python, Java, Javascript + node.js	Video/Audio Production
Excel (pivot tables) or Google Docs	CISCO (or comparable) certification	Linux, Windows Server (certification valued but not without degree)	Photography
Quickbooks	Security+, CySA+, CISA, CISSP certifications	RDBMS (MySQL, MS SQL Server, Oracle) NoSQL (mongo, couchdb); graph db (e.g. Neo4j) for GIS	Writing / storytelling / journalism
Business math	Linux & Open source security tools (e.g. Kali)	Scripting (bash or Powershell)	[Web] Publishing
Salesforce (CRM)	Scripting (bash)	Debugging; Frameworks - AngularJS, React	Social media

Possible Intervention:

Targeted colleges (based on lack of submissions to prior ICT RFA):

- Grossmont College
- Cuyamaca College
- Imperial Valley College
- Palomar College
- Southwestern College

Colleges should, possibly as part of a periodic internal program review, evaluate their offerings in terms of languages, ancillary skills and overall demand, based on labor market information. In addition to current trends, the language “lifespan” should be considered based on existing code that needs supported/rewritten and, for newer languages and/or frameworks, industry backers. The ecosystem size is a proxy for short-term employment opportunities and existing code base will affect long-term prospects. Existing programs without strategic value and where graduates cannot find gainful employment should be discontinued or modified to align to industry needs with a commitment by faculty and by colleges to fund professional development; and participate in meaningful industry engagement. For software development increased focus on upskilling pathways (either through increased coordination with K-12 partners or marketing to incumbent workers) and creation of better marketing collateral, highlighting the ADT career pathways are recommended.

In the area of cybersecurity, a comprehensive review of the student learning outcomes (SLO) entries on all courses in a program leading to a certificate or degree for contrast with exam objectives associated with industry certifications would create a framework for curriculum alignment with industry needs. Once missing components are identified, refined programs may be presented, if needed, for approval. Concurrent to the availability of modern cybersecurity programs, a subsidized funding source for industry certifications is advised as typical cost is \$150-\$400, which may be out of reach for most college students. Finally targeted marketing to incumbent workers is an untapped market due to the certification expirations. A side benefit will be the positioning of regional public community colleges as authoritative organizations for cybersecurity training.

A survey of security program syllabi for SLO that align with certification objectives would be required to assess what modifications would be required to adequately prepare students for jobs in cybersecurity. As industry needs evolve, a static certification holds limited value therefore these certifications must be renewed every 2-3 years or require an addition of continuing education credits.

4) BUSINESS AND ENTREPRENEURSHIP

Problem Statement

Business and Entrepreneurship continues to be not only a popular decision for students but a crucial part of the economy in San Diego. In their recent Resilient Jobs Report²⁰, the San Diego-Imperial Center of Excellence for Labor Market Research reported: (1) of the top 100 middle-skill jobs, 22 are in the business sector, (2) of the top 64 recession-resilient jobs, 11 are in the business sector, and (3) of the 66 pandemic-resilient jobs, 23 are in the business sector. Although all ten colleges in the Region are training for business careers (Exhibit 12) and there are a lot of jobs in the business sector, there are still challenges that can be mitigated to more fully support industry and better prepare students.

Exhibit 12: Business Programs by TOP Code in San Diego and Imperial County

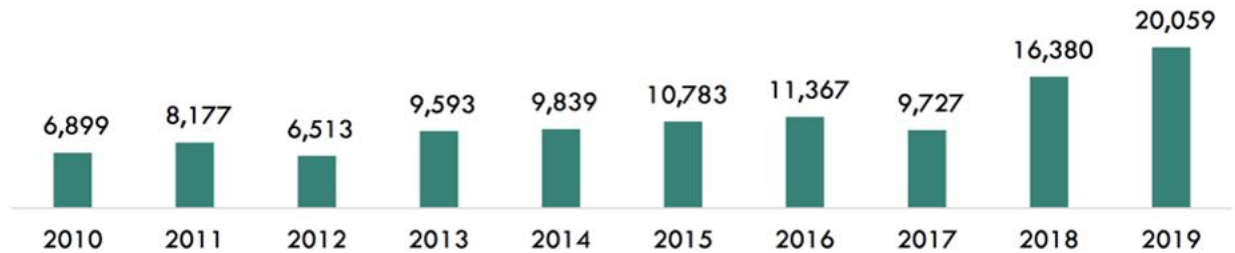
TOP6	TOP6 Program Title	# Programs & Courses
0514.00	Office Technology/Office Computer Applications	64
0514.10	Legal Office Technology	32
0505.00	Business Administration	25
0506.00	Business Management	20
0511.00	Real Estate	17
0509.00	Marketing and Distribution	10
0506.50	Retail Store Operations and Management	9
0506.30	Management Development & Supervision	3
0509.40	Sales and Salesmanship	1

1. Data suggests there is a shortage of Management and Sales programs. According to data pulled from COCI, the Region only has 3 management programs and 1 sales program, despite the data suggesting these are both high demand areas (Exhibit 13).
2. Students need clearer and simplified pathways. In many cases, courses and degrees which train for the same occupations have different course titles and names at each college. Considering the volume of business programs in the Region, this makes it confusing for students.
3. Despite Entrepreneurship programs being at each of the colleges, not all of them are listed in the curriculum inventory and can be difficult to find. These entrepreneurship programs have

21. Resilient Jobs Report. San Diego-Imperial Center of Excellence for Labor Market Research. 2020. https://myworkforceconnection.org/wp-content/uploads/2020/08/Resilient-Jobs_2020-08-27v4.pdf

an opportunity to be cross sector and targeted to help meet specific needs in the local community.

Exhibit 13: Number of Online Job Postings for Sales Occupations in San Diego County (2010-2019)



Possible Interventions:

1. Colleges should create an inventory of all Business, Management, Sales and Entrepreneurship offerings by course and degree. This will provide a better understanding of the programs not represented in COCI and provide a clearer picture for possible curriculum modifications. Through these modifications or updates, colleges should consider creating stackable options for students, specifically targeting noncredit or contract education.
2. Sales, management, entrepreneurship can all be specialized to offer cross-sector training and opportunities (Exhibit 3). Colleges should identify what other programs can benefit from courses in these areas and find ways to integrate these courses in to other programs.
3. Regionally participate in Communities of Practice for coordination, alignment of programs and clearer program naming. This will help students to better navigate different college programs. Once aligned regionally, targeted and possibly joint marketing campaigns can be developed around business programs.
4. Entrepreneurship Programs should seek to align with the LMI and with local communities. This targeted approach will allow colleges to determine what would be the best fit for students and small businesses or startups in the college's service area.
5. Market and publish programs and courses so students understand what they will be learning. In the Gig Economy Report²¹ it was conveyed that "Focus group participants in Imperial County recommended that Imperial Valley College rebrand existing business classes as "gig worker" classes. Participants said that they were well aware of the free classes offered for "businesses" at Imperial Valley College. Gig workers did not consider these classes relevant to them because they did not consider themselves to be businesses. Words such as "entrepreneurship" and "accounting" seemed intimidating or irrelevant to them as gig

22. Gig Economy- Imperial County. San Diego-Imperial Center of Excellence for Labor Market Research. 2019. https://myworkforceconnection.org/wp-content/uploads/2020/05/Gig-Economy-Study_Imperial-County_Full-Report_2019-10-29.pdf

workers. They considered businesses to be companies with multiple employees, whereas they were single employees doing contract work. The participants suggested that a branding change is necessary to appeal to gig workers. IVC could offer courses in accounting or entrepreneurship, but they would need to be branded as courses in how to use the gig economy or how to run a second job in the gig economy.”

Exhibit 14: Percentage of Sales Occupations Employed by Industry in San Diego County (2019)



5) LIFE SCIENCES-BIOTECHNOLOGY

Background and Problem Statements

The Life Sciences and Biotech sector accounts for 59,844 jobs in the San Diego-Imperial region and 17% of all Life Sciences and Biotech jobs in California. There are approximately 1,686 Life Sciences and Biotech establishments in San Diego County, making up 13% of California's Life Sciences and Biotech businesses. The sector is projected to grow over 7% (or 3,950 jobs) in the next five years in both San Diego and Imperial Counties. The average earnings per Life Sciences & Biotech job is \$161,080.²²

Life Sciences and Biotechnology occupations can be categorized into two groups: middle-skill jobs and pathway jobs. Middle-skill jobs are occupations that community college students would be best prepared for after obtaining a certificate or degree. Middle-skill jobs are also known as “technician-level” jobs. Pathway jobs require at least a bachelor's degree or higher. Although many students find work without advanced degrees, many **employers still prefer candidates with more than a community college award.**

Top middle-skill jobs are defined as occupations with the most labor market demand, stable employment growth, and entry-level wages at or above the Self-Sufficiency Standard.²³ Comparing labor market demand with program supply suggests that the **top middle-skill jobs in this sector have supply gaps in San Diego County.** Labor market demand is defined as the number of average annual job openings per year that employers expect to fill for a particular occupation. Program supply is the number of awards (e.g., degrees, certificates) from the community colleges and non-community college providers.

²² Sector Analysis Highlights, Life Sciences-Biotechnology, <https://coecc.net>, 2019

²⁴ The Self-Sufficiency Standard is the hourly wage that a single adult needs to earn to meet basic needs in San Diego County. selfsufficiency.org. Individuals at the 25th percentile earn entry-level wages, while individuals at the median level earn median wages due to a more experience, more training, etc.

Exhibit 15: Middle-Skill Jobs Attainable with a Community College Education

Middle-Skill Jobs Attainable with a Community College Education, San Diego-Imperial Region (2018-2023)

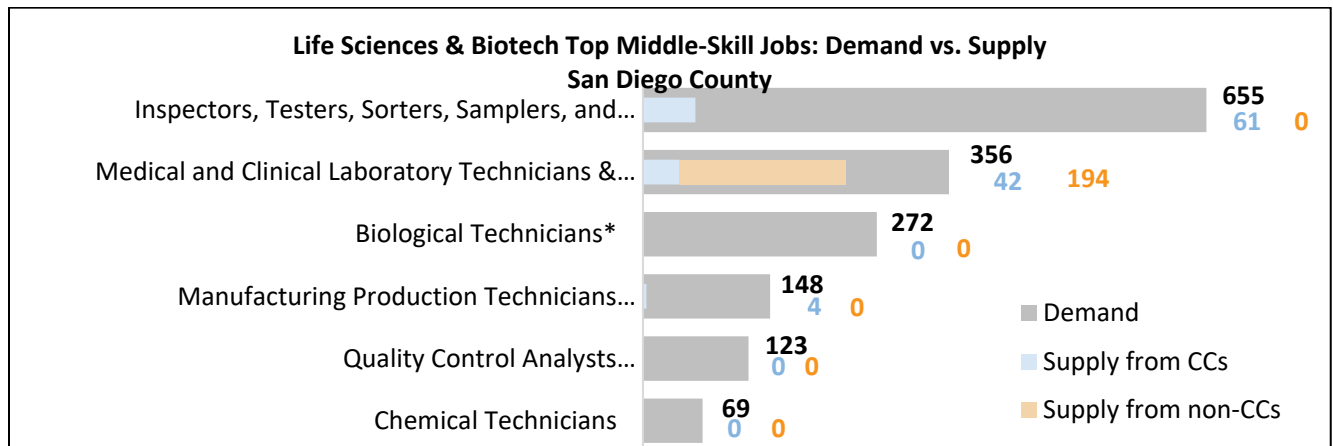
Occupational Title	Annual Job Openings (Demand)	Entry-Level ² Hourly Earnings	Median Hourly Earnings
Inspectors, Testers, Sorters, Samplers, and Weighers	616	\$14.38	\$19.02
Clinical Laboratory Technologists and Technicians	318	\$17.34	\$25.91
Biological Technicians	293	\$19.82	\$24.22
Manufacturing Production Technicians* and Manufacturing Engineering Technologists* (part of Engineering Technicians, Except Drafters, All Other) ³	192	\$26.30	\$33.17
Quality Control Analysts* (part of Life, Physical, and Social Science Technicians, All Other)	132	\$19.00	\$26.01
Chemical Technicians	74	\$17.14	\$22.62

Exhibit 16: Pathway Jobs

Pathway Jobs, San Diego-Imperial Region (2018-2023)

Occupational Title	Annual Job Openings (Demand)	Entry-Level Hourly Earnings	Median Hourly Earnings
First-Line Supervisors of Production and Operating Workers	475	\$22.23	\$29.67
Compliance Officers (includes Regulatory Affairs Specialists)	453	\$28.86	\$39.51
Sales Representatives, Wholesale & Manufacturing, Technical & Scientific Products	430	\$23.00	\$32.49
Medical Scientists, Except Epidemiologists	393	\$37.39	\$49.31
Manufacturing Engineers*, Biochemical Engineers*, and Validation Engineers* (part of Engineers, All Other)	213	\$36.72	\$48.54
Chemists	135	\$26.00	\$34.89
Biological Scientists, All Other	125	\$31.98	\$39.98
Biochemists and Biophysicists	109	\$34.99	\$43.71
Laboratory Managers* and Clinical Research Coordinators* (part of Natural Sciences Managers)	101	\$55.55	\$68.39
Biostatisticians* and Clinical Data Managers* (part of Statisticians)	82	\$39.50	\$50.82
Biomedical Engineers	78	\$31.86	\$54.31
Microbiologists	65	\$33.65	\$44.44

Exhibit 16: Top Middle-Skill Jobs Demand vs. Supply



The asterisk (*) above indicates that four top middle-skill jobs (Inspectors, Testers, Sorters, Samplers and Weighers; Biological Technicians; Manufacturing Production Technicians; and Quality Control Analysts) have the same Taxonomy of Programs (TOP)²⁴ code, Biotechnology and Biomedical Technology (TOP 043000). TOP 043000 supplies only 61 awards,²⁵ but trains for four different occupations with a total labor market demand of 1,198 annual openings, **suggesting a supply gap of 1,137 awards.**

Key Findings and Recommendations

The research objectives were to identify labor market supply gaps in middle-skill jobs; understand where programs exist or do not exist to fill in the supply gaps; and discuss how the region's community colleges could close the supply gaps. The following summarizes the findings and recommendations for the Life Sciences and Biotechnology sector.

- 1. Enrollment numbers are low for existing programs:** While there is high labor market demand, few students enroll in existing Life Sciences and Biotechnology programs. Furthermore, there are not a significant number of K-12 programs that prepare students for postsecondary Life Sciences and Biotechnology programs.

⇒ To increase enrollment numbers, the colleges should conduct a marketing campaign that educates K-12 students about career and coursework opportunities in Life Sciences and Biotechnology. The colleges should also work with middle school and high school counselors, faculty, and other stakeholders to encourage students to enroll in existing community college programs if their interests and strengths align with the sector's jobs. This includes strategies for dual enrollment, articulation agreements, and early work-based learning opportunities. For our incumbent workforce,

²⁴ Other Engineering and Related Industrial Technologies (TOP 099900) also trains for Manufacturing Production Technicians and provides 4 awards in the region. However, TOP 099900 is a general.

²⁵ TOP code and trains for multiple occupations; therefore, it was removed from the supply analysis. TOP is a system of numerical codes used at the state level to collect and report information on community college programs and courses throughout the state that have similar outcomes.

coursework logistics and scheduling strategies that provide increased course availability for working individuals should be implemented to maximize equity. Examples include optimized AM/PM scheduling, cohort tracks, compressed and hybrid course offerings.

- 2. The sector has large labor market demand, but small program supply:** Programs such as Biotechnology and Biomedical Technology (TOP 043000) have large supply gaps and small completion numbers.

⇒ To increase retention and success of students in Life Sciences and Biotechnology, programs for this sector should develop training strategies that include multiple semester offerings, compressed coursework, and cohort scheduling. Correct implementation of these strategies should increase program enrollment, retention, completions, and reduce the regional labor market gap.

- 3. Developing programs south of Interstate 8 (I-8) is challenging to attract students:** Life Sciences and Biotechnology jobs and employers are primarily clustered around State Route 52 (SR 52) and SR 78. Students residing elsewhere in the region are not exposed to Life Sciences and Biotechnology companies and are unfamiliar with jobs in this sector.

⇒ To increase exposure to this sector, colleges south of the Interstate-8 should increase focus on proximal sector opportunities (i.e. Medical Laboratories, Food Sciences & Manufacturing, Environmental Chemistry) and create new strategies to increase sector advocacy and partnerships. Examples include increased training partnerships with medical laboratories, commercial fermentation companies, agriculture technology firms, and environmental chemistry agencies.

- 4. Employers are filling the middle-skill jobs gap with candidates who have bachelor's degrees or higher:** This leads to high turnover once an overqualified individual gets his/her "foot through the door" and moves on to higher positions.

⇒ Programs should develop pathways into specific bachelor's program in parallel with tailored work-based learning opportunities that support the working professional throughout the 4-year training model. Examples include: Pathways and 2+2 agreements into Mira Costa College Biomanufacturing, National University's Clinical Laboratory Sciences, CSU Global Quality Assurance, SDSU Chemistry.

6) ADVANCED TRANSPORTATION & LOGISTICS

Problem Statement

Logistics and supply chain management have become a critical business function in today's global economy²⁶. Companies who actively manage their supply chain do so to lower costs and increase competitive advantages. Supply chain & logistics practitioners can be found in almost every type of business from manufacturing to healthcare.

The San Diego region has seen some large growth in areas of the sector such as planning, which grew by more than 94% between 2009 and 2019²⁷, suggesting that careers in this sector have become very important to the region. Additionally, the sector is under supplied both regionally and statewide by a large margin. San Diego County has annual opening of 6,521 with 1,976 awards. Comparatively, there around 85,659 annual opening in California with only 6,733 awards²⁸. Not only are these careers in high demand, entry-level and median earnings are above the living wage (Exhibit 9a) and employers typically require an associate degree for many of these positions, making them an ideal fit for the San Diego Community Colleges.

Exhibit 16: Hourly* Earnings for Logistics and Supply Chain Management Occupations in San Diego County (Traditional labor Market Information)

SOC Code	Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings
Plan			
13-1081	Logisticians	\$31.89	\$39.01
43-5061	Production, Planning, and Expediting Clerks	\$20.09	\$25.34
Source			
13-1028	Buyers and Purchasing Agents	\$24.06	\$32.82
43-3061	Procurement Clerks	\$19.35	\$22.24
11-3061	Purchasing Managers	\$48.21	\$60.55
Make			
51-1011	First-Line Supervisors of Production and Operating Workers	\$26.16	\$33.67
11-3051	Industrial Production Managers	\$40.00	\$50.33
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	\$17.11	\$22.76
Deliver			
43-5011	Cargo and Freight Agents	\$15.10	\$20.93
53-3031	Driver/Sales Workers	\$13.69	\$17.37
53-1047	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	\$19.61	\$25.05
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$16.39	\$22.33
43-5071	Shipping, Receiving, and Inventory Clerks	\$13.68	\$16.75
Return & Store			
11-3071	Transportation, Storage, and Distribution Managers	\$34.42	\$45.43
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	\$13.72	\$16.66

*To annualize these salaries, multiple by 2080 hours; however, not all employers offer full-time employment for these occupations

²⁶ https://myworkforceconnection.org/wp-content/uploads/2020/12/Logistics-and-SCM-Occupations_2020-11-02v3.pdf

²⁷ https://myworkforceconnection.org/wp-content/uploads/2020/12/Logistics-and-SCM-Occupations_2020-11-02v3.pdf

²⁸ https://myworkforceconnection.org/wp-content/uploads/2020/12/Logistics-and-SCM-Occupations_2020-11-02v3.pdf

Possible Intervention: Expand Existing Programs & Create New Programs to Include Skills and Competencies Required for Careers in Supply Chain & Logistics

Targeted colleges:

- Cuyamaca College
- Grossmont College
- MiraCosta College
- Imperial Valley College
- Palomar College
- San Diego City College
- San Diego Continuing Education
- San Diego Miramar College
- San Diego Mesa College
- Southwestern College

Please note: Any college with a business program could be a potential fit. Colleges with Advanced Manufacturing could also create some interesting possibilities. While there is a logistics and transportation at Southwestern College, there is no regional community colleges offering a supply chain program or short term certification.

Exhibit 17: Common Industry Knowledge, Skills and Abilities

Knowledge Skills & Abilities for Supply Chain & Logistics			
Procurement	Quality Assurance	Forklift Operation	Supply Chain Management
Communication	Customer Service	Scheduling	Analytical Skills
Microsoft Suite	Logistics	Data Entry	Leadership
Organization	Enterprise Resource Planning (ERP)	Administration	Shipping & Receiving
Inventory Management	Collaboration	Operations Management	Detail-Oriented

Exhibit 18: Focus Group Highlighted Knowledge, Skills and Abilities

Knowledge, Skills & Abilities for Supply Chain & Logistics (Focus Group)			
Contracting	Business Law & Regulation	Negotiation	Ecommerce
Project Management	Cultural Competence related to Customer Service	Federal Regulation Acquisition (FAR) exposure	Excel

International Trade & Customs			
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