

Community college bioscience programs provide a largely untapped source of skilled talent. Find out what makes students trained at community colleges such a valuable resource to your core facility.

Community Colleges: Best Kept Secret for Finding Skilled Talent

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Advancing Bioscience Education and Training in California
Hosted at MiraCosta College



Hiring Practices: BS Degree vs Skills-Based

Does having a BS degree = better employee?



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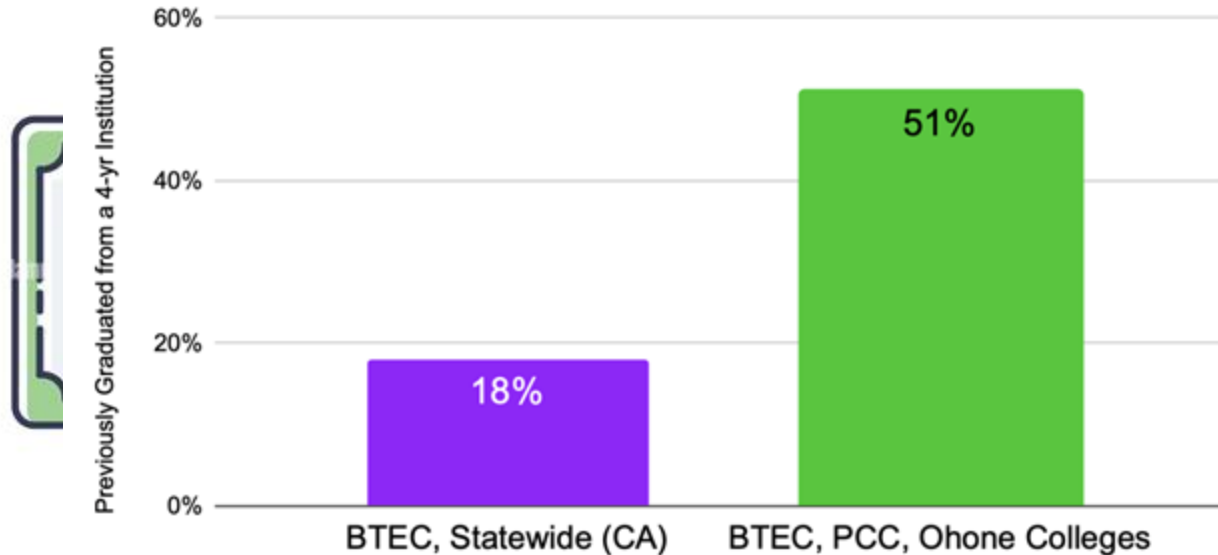
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Hiring Practices: BS Degree vs Skills-Based

Does having a BS degree = better employee?

Previously Graduated from a 4-yr Institution vs. Other



Why Community Colleges?

- Diverse student population
- Career Technical Education (CTE)

programs:

- Skills-based
- Well funded
- Industry-focused



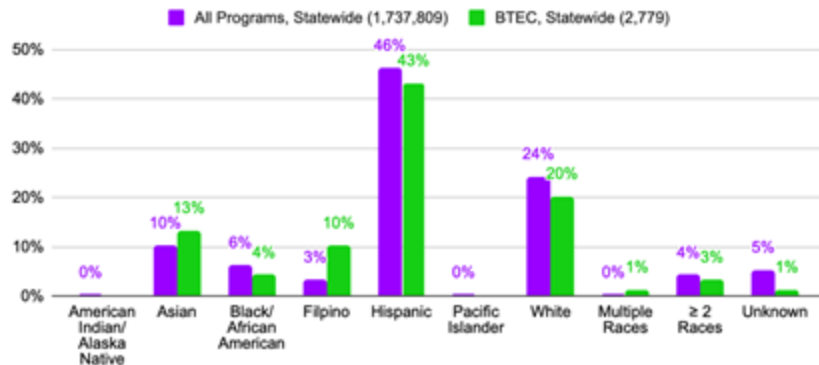
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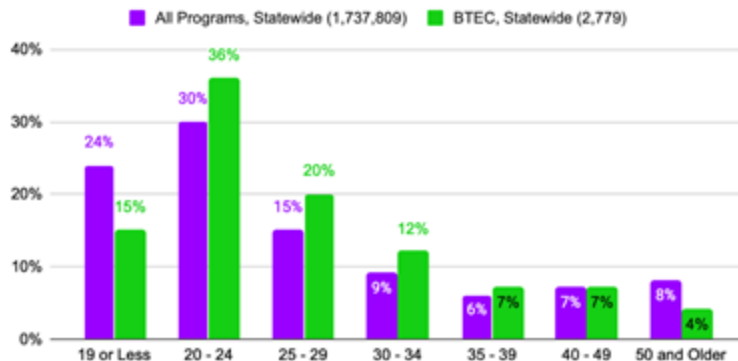


Who Are Our Students?

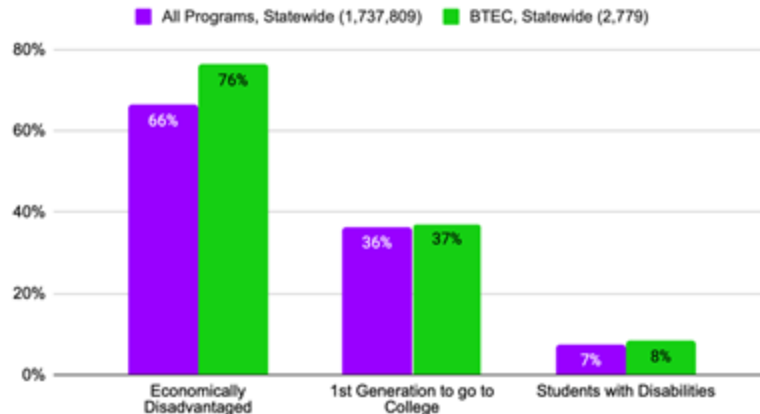
Ethnicity



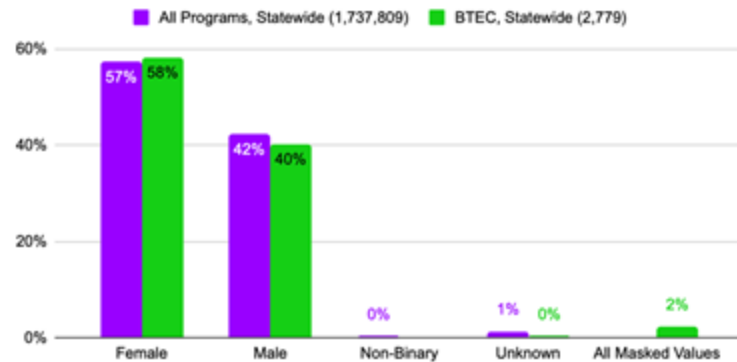
Age Groups



Disadvantaged Students



Gender



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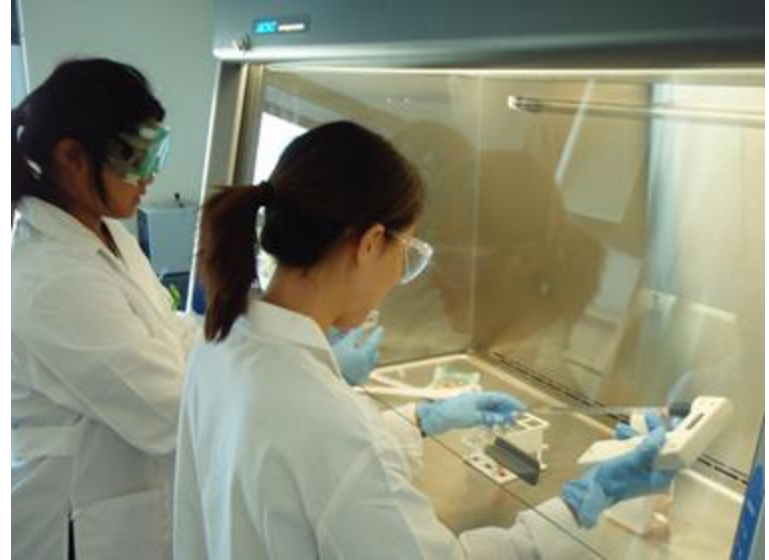
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Skills: Entry-Level Technicians

- Critical work functions:
 - Maintain safe & productive work environment
 - Routine facility support
 - Perform measurements / tests/ assays
 - Comply with regulations & standards
 - Manage & communicate information
 - Perform mathematical manipulations
 - Troubleshooting & problem solving



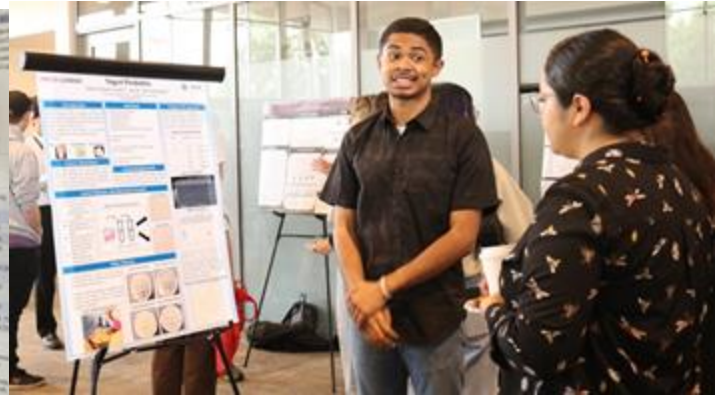
Skills: Entry-Level Technicians

Including and not limited to:

- **Lab safety:** MSDS; PPE; handling, storage, removal of biohazards & chemicals
- **Good documentation:** lab notebooks, SOPs, Batch Records, graph data analyses
- **Biological solutions:** concentration calculations; dilutions; buffer & media prep
- **Analytical measurements:** volumes, mass, pH, temperature
- **Techniques:** Western Blot, ELISA, chromatography, protein assay, centrifugation, filtration, DNA & protein electrophoresis, PCR, plasmid purification, microscope use & care
- **Basic microbiology:** aseptic technique, microbial growth, bacterial transformation
- **QA/QC:** cGMP standards, software validation, document change control, microbial testing, endotoxin screening, basic bacterial identification



CC Student Enrichment



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Who Are Our Faculty?

- Highly educated: many have a PhD
- Many with industry experience
- Ongoing professional development
- Grant-funded research & WD
- Faculty teach their own classes
- Students get one-on-one time with faculty



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State-of-the-Art Modern Facilities

- Dedicated lab space
- Well-equipped



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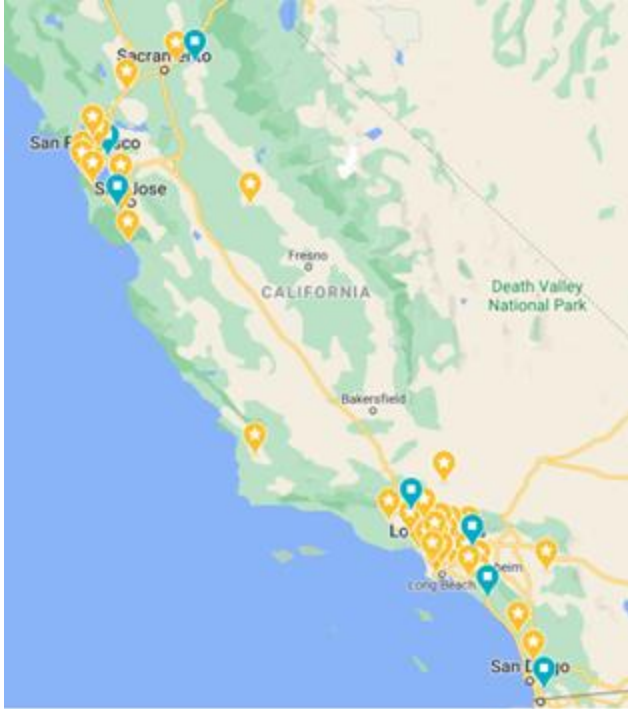


CC Biomanufacturing BS Degree Programs in California

- Skills-based
- \$10,500 total tuition (all 4 years!)
- All AS Degree credits articulate (no credits are lost)
- Upper division focus on bioprocessing, and quality & regulatory compliance
- BS Degree programs articulate to graduate programs



CC Bioscience Programs in CA



Active Certificate & AS Degree Programs:

- 32 Biotech/Biomanufacturing Programs
- 6 Medical Laboratory Technician Programs
- 4 Chemical Technology Programs
- 2 Histotechnology Programs
- 1 Computational Biology Program

AS Degree Programs Under Development:

- 3 Biotech/Biomanufacturing Programs

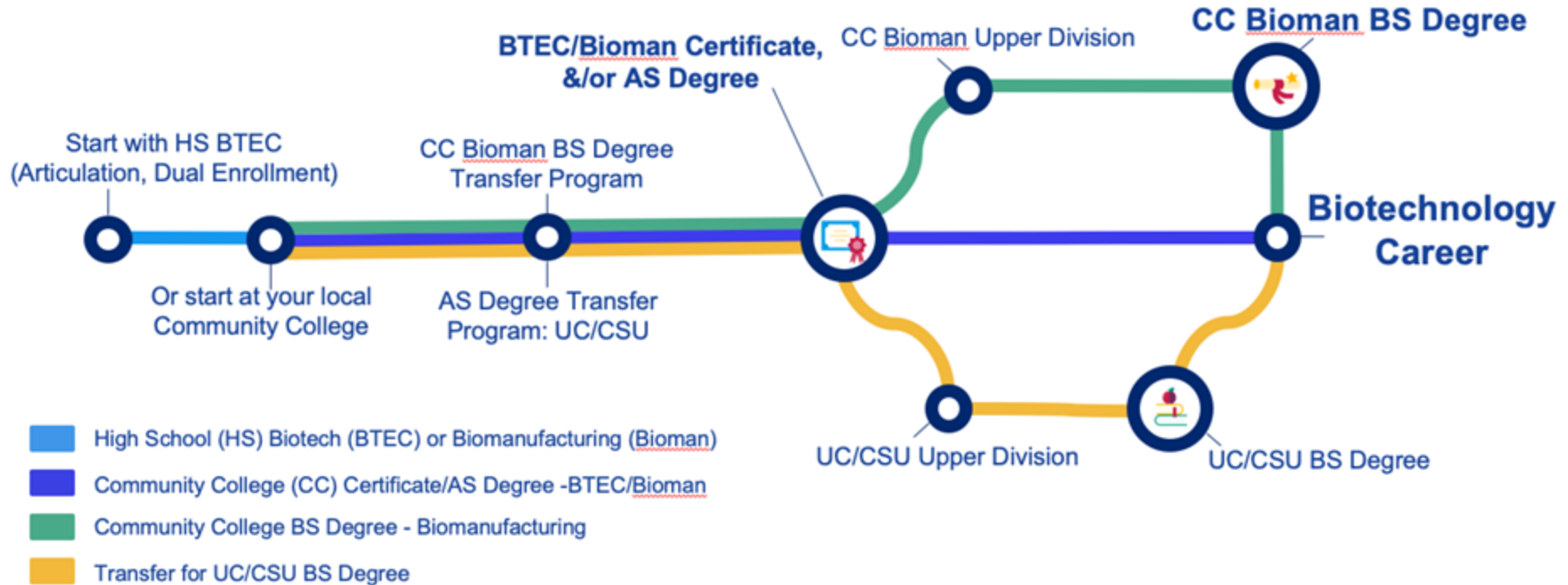
BS Degree Programs:

- 5 Active Programs (4 Biomanufacturing; 1 Histotech)
- 1 Approved Program (Biomanufacturing)
- 1 Awaiting final approval (Stem Cell Tech)



Pathways

All Pathways Lead to Exciting Careers in Biotechnology



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What Does This Mean for Your Facility?

Trained and skilled resources:

- Interns
- Apprentices
- Transfer students
- Employees



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Ways to Engage with CCs: Interact with Your Local College

- Serve on a program advisory board
- Provide company tours for students & faculty
- Classroom visits
- Mentor a student
- Assist with resume writing & mock interviews
- Share job postings



Ways to Engage with CCs: Work-Based Learning

- Internships & pre-apprenticeships
 - Typically 2 - 12 weeks
 - Paid or unpaid
 - Some grant funding available
- Apprenticeships
 - Typically 1-2 years (~2,000 hrs)
 - Competency- or time-based
 - On the job training
- Externships for CC faculty



CA Bioscience Workforce Development Hub Grant Activity

Grants	Supported Activities
CAI* Apprenticeship (2) CAI* Planning (1) CAI* Pre-Apprenticeship (2) CIRM COMPASS† (1) NSF ATE‡ (1) NSF ATE‡ Center Grant (1) NSF ExLENT§ (1) Perkins Reserve (1) Strada Challenge (1)	Work-based learning for students: <ul style="list-style-type: none"> • Biotech/biomanufacturing internships, pre-apprenticeships, and apprenticeships • Food safety pre-apprenticeships and apprenticeships • Medical scientist apprenticeships • Supply chain operations Faculty professional development <ul style="list-style-type: none"> • Quality • Accessible learning/ Universal Design for Learning • Supply Chain Operations & Lab Kit Production DEIA <ul style="list-style-type: none"> • Developing pathways to employment in biotech/ biomanufacturing for individuals with disabilities

*California Apprenticeship Initiative

†CA Inst. of Regenerative Medicine, Creating Opportunities through Mentorship and Partnership Across Stem Cell Science

‡National Science Foundation, Advanced Technical Education

§National Science Foundation, Experiential Learning for Emerging & Novel Technologies



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InnovATEBIO: Nat'l NSF BTEC Education Center

(innovatebio.org)



- State Teams for workforce development
- Hubs - leadership and areas of expertise
 - Alumni Network
 - Careers & Entrepreneurship
 - High School Pathways
 - Industry & Workforce Development
 - Supply Chain
 - Student Research
 - Genomics
- Biotech programs
- Biotech careers



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Coming Soon: CA Statewide BILT Industry Advisory

Business & Industry Leadership Team

- Engaged industry participation
 - BILT co-led by industry experts
 - Trends identified
 - Skills validated annually
 - Curriculum updated & shared nationally
- Faculty attendance
- Meets quarterly
- Enhances workforce training



Proposed NSF ATE Consortium Grant Project

Establish community college / core facility partner network

Develop bioanalytical technical courses & materials + research experiences

Industry & academic workforce development

Increased # of technicians with biomolecular analysis skills
Advanced skills-based hiring practices
New workforce resources for core facilities



Flow Cytometry

Cell populations
Cell isolation
Immunology
Cell & Gene Therapy



Microscopy & Imaging

Spatial omics
Histology
Cell culture
Cryo-EM



DNA Sequencing

Genomics
Diagnostics
Gene expression
Single cell analyses



Mass Spectrometry

Proteomics
Protein identity
Drug discovery
Biomarker discovery



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Thank You!



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Slides and Resources

Includes Accessibility & UDL Training Recordings

Presentation slides:

https://docs.google.com/presentation/d/1Bez-hDpesXRAIxXw6JTBtgEuQ_zPsecY/edit?usp=sharing&oid=108428321158972705076&rtpof=true&sd=true

Accessible learning recordings:

These two webinars provide tips and resources that help to make materials accessible to different styles of learning due to disabilities, language and/or other barriers, or preferences:

1. Intro to Accessibility Webinar recording:
https://docs.google.com/forms/d/e/1FAIpQLSfMa4OFzX5r-jyt7yx4T8BnMIECli9ayMFktaU-waqmWCapfg/viewform?usp=sf_link
2. Intro to Universal Design for Learning (UDL) Webinar recording:
https://docs.google.com/forms/d/e/1FAIpQLScHu4LKsceYmVT6F2ACwH1E4Ir3Ivyui7ENdcWWFwsy2w34Ag/viewform?usp=sf_link
3. Links to slides & resources to accompany both recordings:
<https://docs.google.com/document/d/1C9xUHGA1CS99ezQ7G1JvxKI6QDbcqHUFVKgYPfOKxb4/edit?usp=sharing>
4. BioSCOPE Home Base:
<https://docs.google.com/document/d/1C9xUHGA1CS99ezQ7G1JvxKI6QDbcqHUFVKgYPfOKxb4/edit?usp=sharing>

If you have questions and/or need anything else, you can reach me at tquenzer@miracosta.edu.