BAKERSFIELD COLLEGE

Bachelor of Science in Industrial Automation: Strategies for Scalability

Bakersfield College (BC) serves over 37,000 students annually and we continue to grow, having seen a nearly *50 percent increase* in enrollment in the past five years. Bakersfield College plays a critical role in improving the quality of life for the great majority of the citizens of Kern County who come from underserved communities.

Why Industrial Automation: With industries rapidly moving to utilize automated processes and with the evolution of technology, robotics, and artificial intelligence, automation has been a high priority among BC faculty. When presented to the Academic Senate in 2014, BC faculty were particularly energized by a broadly applicable curriculum, which has been intentionally designed to cut across all industries, preparing graduates to succeed many fields statewide and nationally.

Meeting Workforce Demands: Bakersfield College's Bachelor of Science (B.S.) in Industrial Automation (INDA) has been visionary in serving as the central provider of highly qualified graduates for positions in the Central Valley. Automation has decreased cost while increasing productivity, leading to growth in the STEM industry in the Central Valley. The program's unique specialization in automation supplies a steady, well-qualified workforce to companies in the Central Valley that have traditionally outsourced work to meet demand.

BC has already graduated two cohorts of B.S. in INDA students and has a multi-pronged strategy to expand the program exponentially and increase the number of graduates:
Executive Summary: aggregate of projections through a four-pronged strategy:

- Lower Division Pipeline into Upper Division B.S. in Industrial Automation
- Early College Pipeline into the B.S. in Industrial Automation
- Transfer Pipeline from Community College System
- Baccalaureate Pipeline for Incarcerated Students

Through the innovative and complementary strategies, BC conservatively projects it will see over 500 students graduate with a B.S. in Industrial Automation by 2025.

Graduation Year	BC's AS Pipeline	Early College Pipeline	CC Transfer Pipeline	Inmate Scholars Pipeline
2020	11	--	--	--
2021	19	--	--	12
2022	15	15	--	14
2023	70	20	20	16
2024	77	25	22	18
2025	85	30	25	20
Sub total	**277**	**90**	67	**80**
TOTAL: 514 B.S. in INDA Graduates by 2025				

A description of each of the four strategies follows.

STRATEGY #1: Lower Division Pipeline in Industrial Automation

Prepared by Lora Larkin and Cynthia Quintanilla

Program pathway improvements include a new Associate of Science degree in Industrial Automation, serving as a direct lower division pipeline into the Bachelor of Science in Industrial Automation. Program faculty and staff disseminate program information to the 116 students currently enrolled in the lower division pipeline while coordinating directly with the lead counselor to ensure students who intend to enroll in the bachelor's program declare the associate's degree as their program of study, ensuring accurate program data and projections.

Upon enrollment in the pipeline, the lead program counselor and advisors have taken a case management approach to student enrollment and completion. The counselor works with students to ensure course offerings, scheduling, and modality are responsive to student needs.

Graduation Year	Projected Graduates
2020	11
2021	19
2022	15
2023	70 (lower division transfers)
2024	77 (+10%)
2025	85 (+10%)
TOTAL	**277**

Through these strategies, BC will see a major spike in baccalaureate program completers in 2023 as students in the lower division pipeline complete their coursework, transfer with an associate's degrees into the upper division baccalaureate program, and complete the B.S. program. BC projects 60% of those transfers complete.

STRATEGY #2: Early College Pipeline

Prepared by Kylie Swanson, Abel Guzman, and Cynthia Quintanilla

Bakersfield College aims to increase enrollment in the B.S. in Industrial Automation program by targeting students who participate in prerequisite or introductory courses in the pathway through dual enrollment opportunities at their high school sites. Intentional alignment with BC's Early College program – among the largest in the state with over 11,200 enrollments annually, will expand BC's bachelor's program capacity. Early College is also BC's signature strategy in addressing equitable college access and completion, with students of color representing 90% of participants and achieving a 90% course success rate consistently[1].

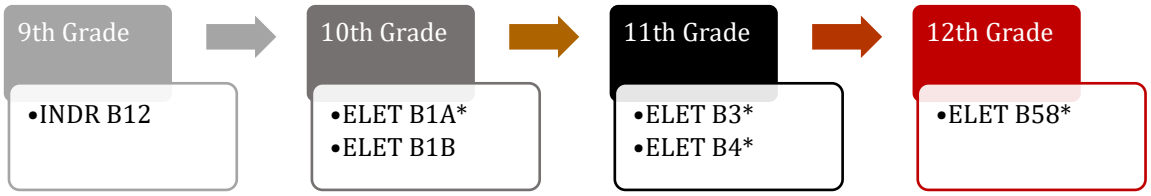
BC's intentional recruitment will create a pipeline for students to enter the baccalaureate program beginning as early as the 9th grade. The following actions support program recruitment and expansion of the baccalaureate pipeline via Early College:

- Comprehensive student educational plan mapping from the 9th grade to the baccalaureate
  - 374 students on the lower division baccalaureate pathway in fall 2019
  - Expansion of the Program Pathways Mapper to baccalaureate completion underway
- Intentional recruitment activities through Early College
  - Full-time faculty member based in Delano and supporting expansion at Robert F. Kennedy High School
  - BC INDA faculty member committed to establish and expand at Wasco High School

[1] Hechinger Report: More Latinx Students Gain Diplomas on Time Thanks to Early College

- Ongoing presentations at high school sites to students, counselors, and parents
- Host students on-site for tours and demonstrations

- Intentional Scheduling to ensure progression toward B.S. program entry
  - Offer introductory courses to INDA pathway at 12 high schools leading toward a Certificate of Achievement in Industrial Automation
  - Strategic scheduling of Electronics courses to align with high school schedules to expand concurrent enrollment opportunities



The pattern is clear: ***extending the baccalaureate pipeline into the 9th grade will significantly contribute to Bakersfield College's baccalaureate degree program graduates.*** For instance, if only 25% of students who start on the bachelor's degree path complete their program by 2025, Bakersfield College could still expect 805 additional graduates.

Graduation Year	Projected Graduates
2022	15
2023	20
2024	25
2025	30
TOTAL	**90**

As BC scales its Early College efforts to additional high school sites, so, too, will Early College B.S. in Industrial Automation student enrollment. Accounting for site expansion to additional high schools, BC could project double the Early College high school site participants in the next 3 years, resulting in as many as 678 additional B.S. graduates in 2023-2024.

STRATEGY #3: Transfer Pipeline from Community College System

Prepared by Cynthia Quintanilla and Tony Cordova

Bakersfield College has been working with other California Community Colleges to create articulation agreements and Memorandums of Understanding which formalize a pipeline from other community colleges into BC's B.S. in Industrial Automation program. Currently, BC has a strong partnerships and articulation agreements with the following institutions which are in relatively close proximity to the BC campus:

- College of the Sequoias
- Fresno City College
- Madera Community College
- San Joaquin Delta College
- Taft College
- West Hills College
- Clovis Community College

Graduation Year	Projected Graduates
2023	20
2024	22 (+10%)
2025	25 (+10%)
TOTAL	**67**

By strengthening the transfer pipeline, BC anticipates its first cohort of transfers to matriculate into the upper division coursework at BC in fall 2021 and approximately 30 transfers each subsequent year. To broaden accessibility of the program, Bakersfield College is also working on articulation

via the C-ID project, allowing interested students from across the state to complete pre-requisite coursework prior to transfer, thus allowing for a seamless transfer into our B.S. in Industrial Automation and contributing to growth in graduates.

STRATEGY #4: Baccalaureate Pipeline for Incarcerated Students

Prepared by Manny Mourtzanos and Cynthia Quintanilla

Bakersfield College is a leader in providing high quality education to incarcerated students, serving over 1,800 incarcerated students across nine prisons and 15 yards. Through BC's program, 14 students stand ready to matriculate into a bachelor's degree pathway, having already completed their A.A. degrees through BC at Kern Valley State Prison – Yard B.

Graduation year	Projected Graduates
2021	12
2022	14
2023	16
2024	18
2025	20
TOTAL	**80**

Carving a pathway to bachelor's degree completion for incarcerated students not only addresses a major societal need, it gives these 14 inmate scholars the opportunity to pursue advanced education. BC has approximately 65 other students in the pathway at KVSP and anticipate 10 to 15 graduates per year given scheduling constraints. No other community college in the state is offering face-to-face instruction leading to a bachelor's degree. With this scale-up, BC anticipates graduating up to 80 students with a B.S. in Industrial Automation by 2025.

INDUSTRIAL AUTOMATION

Bakersfield College has poised itself to facilitate the needs of both students and the community that they serve by partnership with industry advisors. I firmly believe that the Legislative Analyst Office must advise the State of California to affirm the bachelor's degree program permanently. To discontinue the program would be a disservice to the communities that are served, the people of the State of California, and industries across the nation that will greatly benefit from the invaluable training that is offered at a price point that makes it possible to attain.

-Chad Hidalgo '19, B.S. in Industrial Automation

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