

Bakersfield College
CTE Program Endorsement
Bachelor of Science in Industrial Automation Degree

Appropriateness to Mission

The Bakersfield College Mission Statement was revised in 2015 to reflect the college's participation in the California Community College Baccalaureate Degree Pilot Program.

Bakersfield College Mission Statement:

Bakersfield College provides opportunities for students from diverse economic, cultural, and educational backgrounds to attain Associate and Baccalaureate degrees and certificates, workplace skills, and preparation for transfer. Our rigorous and supportive learning environment fosters students' abilities to think critically, communicate effectively, and demonstrate competencies and skills in order to engage productively in their communities and the world.

The new Bachelor of Science degree program in Industrial Automation fulfills the college mission as illustrated in the program mission statement established by the discipline faculty and listed below.

Industrial Automation Baccalaureate Program Mission Statement:

The Baccalaureate Program in Industrial Automation is designed to prepare individuals for technical management careers in industries which utilize automation, including the petroleum, manufacturing, logistics and agriculture industry sectors, in order to improve the regional economy.

Statement of Program Goals and Objectives

Bakersfield College is will be offering an upper division program in Industrial Automation to complement our existing robust lower division electronics technology program, resulting in a Bachelor of Science Degree in Industrial Automation (BSIA), approved by the Board of Governors baccalaureate degree pilot program for California Community Colleges.

The current Electronics Technology Program provides certificate and degree options which prepare technicians in the areas of instrumentation, automation, process control and telecommunications. These include four job skills certificate options (Manufacturing Automation, Industrial Maintenance, Industrial Automation, and Industrial Communications); an Electronics Certificate of Achievement; and an Electronics Technology A.S. degree. Building upon this foundation of technical training, the upper division coursework in Industrial Automation will help in filling the employment gap between the technician and engineer by preparing individuals to be employed in technology positions that require project management skills but not the extensive design skills of engineers.

Catalog Description

Industrial automation represents the technology-driven business model of the 21st century. In today's industry, engineers involved in developing new products or processes work closely with technologists who apply scientific and technical knowledge in the design, manufacturing, and repair of automation systems. Bakersfield College's Bachelor of Science in Industrial Automation (BSIA) Degree will train students with the skill set those technologists require, meeting the needs of a host of local employers, including major companies in the agriculture, distribution, and manufacturing sectors.

This degree focuses on the application of electronics and computer technology to industrial automation systems, which may apply to various categories of job titles in the following areas:

- Maintenance of Industrial Equipment
- Automation (Programmable Logic Controllers/PAC's, robotics, materials and product handling, motion control/ motor drives, networked control systems, automated production equipment, integration of various technologies into solutions, and related areas)
- Process Control and Measurement (Instrumentation, Industrial Measurement)
- Quality Assurance/Quality Control
- Industrial Safety and Hygiene
- Technical Management (managing technical employees)
- Operations Management (managing company operations)
- Facilities Planning, Infrastructure, Upgrade Supervision
- Operations Management
- Technical Sales and Marketing
- Design and Engineering Operations (positions that do not require the employee to have completed a four-year Engineering degree and/or be licensed)

The program prepares students for careers in the design, operation, and management of industrial automation systems focusing on the local industries that utilize these technologies, such as petroleum production, food production, fabrication, and logistics. Significant emphasis is placed on project based learning facilitated by significant laboratory work.

Program student learning outcomes:

Program Learning Outcomes for the Bachelor of Science in Industrial Automation Degree Program were developed and aligned with the Institutional Learning Outcomes.

Institutional Learning Outcomes	Programming Learning Outcomes
<p>1. Think. Think critically and evaluate sources and information for validity and usefulness.</p>	<p>Upon completion of this program, a student will be able to:</p> <ul style="list-style-type: none"> - Apply critical and analytical thinking skills to industry related problems, related to safety, quality assurance and design of systems.
<p>2. Communicate. Communicate effectively in both written and oral forms.</p>	<p>Upon completion of this program, a student will be able to:</p> <ul style="list-style-type: none"> - Display effective communication skills, including presentation and technical writing skills.
<p>3. Demonstrate. Demonstrate competency in a field of knowledge or with job-related skills.</p>	<p>Upon completion of this program, a student will be able to:</p> <ul style="list-style-type: none"> - Demonstrate a broad understanding of the mathematical and scientific principles utilized in industrial automation and manufacturing. - Demonstrate competency in industrial automation and instrumentation, including relevant hardware and software utilized in industry.
<p>4. Engage. Engage productively in all levels of society—interpersonal, community, the state and nation, and the world.</p>	<p>Upon completion of this program, a student will be able to:</p> <ul style="list-style-type: none"> - Manage automation and manufacturing projects applying knowledge of budgetary and scheduling principles in an ethical environment.

Program Requirements

This new program will begin in Fall 2016 and includes 41 lower division and 9 upper division General Education units, 19 required lower division units in Electronics Technology, and 51 upper division units in Industrial Automation, totaling 120 units.

BSIA Degree Curriculum

Lower Division Curriculum

CSU GE Breadth	Units
A.1 Oral Communication	3
A.2 Written Communication (ENGL B1a)	3
A.3 Critical Thinking	3
B.1 Physical Universe (Physics B2a or higher required - satisfies B.3 Lab requirement) ¹	4
B.2 Life Science	3
B.3 Laboratory Activity	
B.2 Mathematics/Quantitative Reasoning (Math B1a required) ²	4
C. Arts and Humanities	9
D. Social Sciences	9
E. Lifelong Learning and Self-Development	3
Total	41

Lower Division Technical Core	Units
ELET B1 (Basic Electronics)	4
ELET B4 (Computer Integrated Manufacturing)	3
ELET B5 (Programmable Logic Controllers)	3
ELET B55a (Electric Motors - Controls)	3
ELET B56 (Instrumentation and Process Control)	3
ELET B70 (Mechanical Systems)	3
Total	19

¹Or Physics B4a or higher

²Or Math B2, Math B6a or higher

Total Lower Division GE	41
Total Lower Division Technical	19
Total Upper Division Technical	51
Total Upper Division GE	9

Total Units 120

Upper Division Curriculum

Upper Division General Education	Units
Technical Writing	3
Industrial Organizational Psychology	3
Industrial Ethics	3
Total	9

Upper Division Technical Core	Units
INDA B100 (Industrial Safety Principles and Management)	3
INDA B100a (Industrial Design Graphics I)	3
INDA B100b (Industrial Design Graphics II)	3
INDA B110 (Materials Science for the Technician)	3
INDA B110 (IA Networks)	3
INDA B112 (IA Systems)	3
INDA B114 (IA Measurement)	3
INDA B116 (Industrial Motion Control)	3
INDA B120 (Industry Sector Seminar: Applied Automation)	3
INDA B122 (Industry Sector Seminar: Manufacturing and Production)	3
INDA B124 (Industrial Manufacturing Processes)	3
INDA B130 (Project Management and Budgeting)	3
INDA B132 (Leadership and Entrepreneurship)	3
INDA B134 (Quality Assurance)	3
INDA B135 (Facilities Planning and Operations)	3
INDA B140 (Systems Design and Integration)	3
INDA B141 (Systems Implementation)	3
Total	51

Background and Rationale

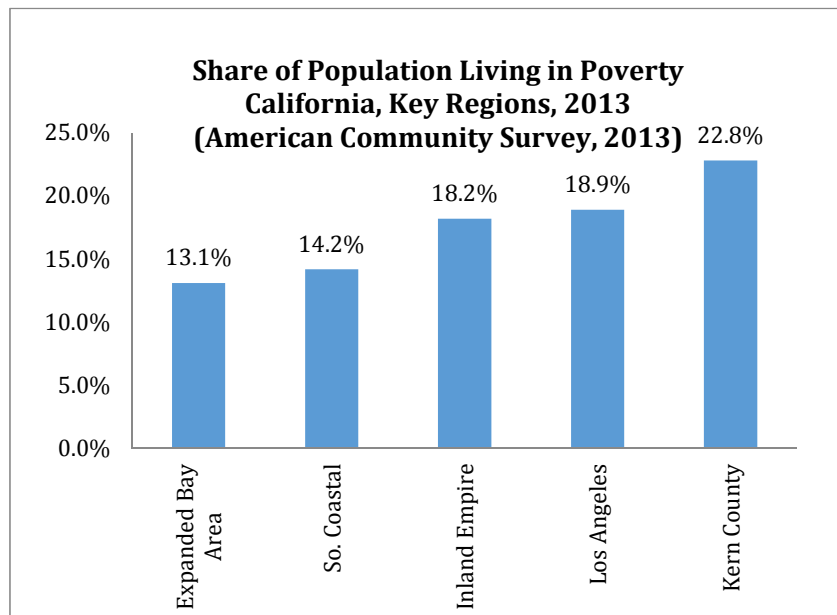
Bakersfield College (BC), founded in 1913, is the largest of three colleges in the Kern Community College District (KCCD). Geographically, KCCD, one of the biggest community college districts in the

United States, covers nearly 25,000 square miles, spanning the bulk of California’s southern San Joaquin Valley. This area is primarily a rural region whose employment is powered by agriculture, oil and gas, and manufacturing and logistics industries. In the past ten years, the region’s population has grown 16% to about 2.27 million people. The communities offer expanding economies coupled with high poverty and unemployment, representing some of the highest such rates in California. Educational opportunity in this rural frontier, then, is paramount, and Bakersfield College has historically served much of the rural communities’ educational needs with excellence.

Today, more than 20,000 students annually enroll in classes at Bakersfield College on its Panorama Drive campus, as well as taking classes in its centers in downtown Bakersfield and the rural community of Delano, 40 miles north on the Kern/Tulare County line. BC’s satellite sites also provide classes in other rural communities such as Wasco, McFarland and Arvin as well as a robust online enrollment. BC’s students represent the distinct and diverse microcosm of California’s central valley. Bakersfield College is a federally designated Hispanic Serving Institution (HSI). Nearly two-thirds of its students count on financial aid to help them achieve their educational attainment goals. Vocational students represent the largest number of successful course completers at BC, with more than 77% of vocational students completing courses with a grade C or better.

US Census data indicates that Kern County, the county in which Bakersfield College is located, is ranked 35th out of 58 counties among populations having a constituency of ages 25 years and over.

Of the 503,688 constituents that are classified within that population, only 15.3% have bachelor’s degrees compared to the national average of 20%. Further, using poverty level as a measure, Kern County ranks below the United States average as well as the California average when comparing Baccalaureate attainment and those individuals classified below the poverty level, registering at a 0.7% rate. In addition, Hispanic/Latino



Baccalaureate attainment also ranks below the United States and California averages at 5.1%. The only public four year university in the county is California State University, Bakersfield (CSUB). Established in 1970, CSUB serves 8,520 students with over 50 different Bachelor’s and Master’s degree programs but not industrial automation.

The current Electronics Technology program, which is the foundation of the BSIA degree program, provides four job skills certificate options to students (Manufacturing Automation, Industrial Maintenance, Industrial Automation, and Industrial Communications); an Electronics Certificate of Achievement; and an Electronics Technology A.S. degree. There are eleven courses within the

Electronics Technology program that comprise the curricular requirements of these certificates and degrees.

In 2014-2015 the Electronics Technology program enrolled 359 students, a 32% increase from the previous year. The Engineering and Industrial Technology Department offered 32 sections of Electronics with 87% retention and 72% success rates. There were 62 certificates and degrees awarded during this academic year, including 23 certificates in automation.

Currently, BC has a large pipeline of students interested in applying for the Bachelor of Science in Industrial Automation Degree. Students who have completed certificates and/or A.S. degrees in Electronics Technology and are working in industry report they are denied promotional opportunities due to the lack of a technical B.S. degree similar to the BSIA.

This new program will allow opportunities within our community for students to obtain a baccalaureate degree in a technical discipline for an estimated tuition cost of \$10,000.

Curriculum Standards

Display of Proposed Sequence

Suggested Lower Division Pattern

Freshman Fall Semester	15 Units
GE Area D (Social Sciences)	3
Math B1a (GE Area B4) ¹	4
Phys B2a (GE Areas B1/B3) ²	4
ELET B1 (Basic Electronics)	4
Freshman Spring Semester	15 Units
ENGL B1a (GE Area A2)	3
GE Area C (Arts and Humanities)	3
GE Area D (Social Sciences)	3
ELET B5 (Programmable Logic Controllers)	3
ELET B70 (Mechanical Systems)	3

Sophomore Fall Semester	15 Units
GE Area B2 (Life Sciences)	3
GE Area C (Arts and Humanities)	3
GE Area A3 (Critical Thinking)	3
GE Area D (Social Sciences)	3
ELET B55a (Electric Motors - Controls)	3
Sophomore Spring Semester	15 Units
GE Area C (Arts and Humanities)	3
GE Area E (Lifelong Learning and Self-Development)	3
GE Area A1 (Oral Communication)	3
ELET B56 (Instrumentation and Process Control)	3
ELET B4 (Computer Integrated Manufacturing)	3

Required Upper Division Pattern

Junior Fall Semester	15 Units
INDA B114 (Industrial Safety Principles and Management)	3
INDA B105 (Materials Science for the Technician)	3
INDA B110 (IA Networks)	3
INDA B112 (IA Measurement)	3
INDA B100 (Industrial Design Graphics I)	3
Junior Spring Semester	15 Units
GE Upper Division: Technical Writing	3
INDA B101 (Industrial Design Graphics II)	3
INDA B120 (IA Systems)	3
INDA B122 (Industrial Motion Control)	3
INDA B124 (Industry Sector Seminar: Applied Automation)	3

Senior Fall Semester	15 Units
GE Upper Division: Industrial Organization Psychology	3
INDA B132 (Project Management and Budgeting)	3
INDA B150 (Systems Design and Integration)	3
INDA B134 (Industry Sector Seminar: Manufacturing and Production)	3
INDA B130 (Industrial Manufacturing Processes)	3
Senior Spring Semester	15 Units
GE Upper Division: Industrial Ethics	3
INDA B144 (Leadership and Entrepreneurship)	3
INDA B140 (Quality Assurance)	3
INDA B142 (Facilities Planning and Operations)	3
INDA B151 (Systems Implementation)	3

Transfer Applicability (if applicable)

Is this Program transferable and if so, who will it be transferable to? As the guidelines for the Baccalaureate Degree Program are developed at the state level, articulation for transfer will be discussed with four year public universities. Currently, individual UCs and CSUs will examine INDA courses on a case by case basis to determine if course credit can be transferred to their institution.

Need for the Program

Enrollment and Completer Projections

1. Who offers and from what area? No other community college or four year public institution in California offers this program.

2. How will you recruit for Program?

Currently, the college has a large pipeline of students interested in applying for the Baccalaureate in Industrial Automation Degree at Bakersfield College. Many have completed certificates and/or A.S. degrees in Electronics Technology and are working in industry; however, often they are denied promotional opportunities due to the lack of a B.S. degree similar to the BC proposed degree.

Partnerships with regional educational institutions have been formed to develop pathways into the BSIA program for high school students. This includes dual enrollment models funded with the California Career Pathways Trust grant.

Regular information sessions and Open Houses will be conducted. Currently, a strong website presence is being developed.

3. Approximately how many students will be enrolled in the course/Program? How many completers once up and running? Justify how you got to this number.

A detailed semester-by-semester educational plan was developed for incoming freshmen, sophomores, juniors and seniors. We expect enrollment in the lower division electronics program to increase along with the admittance of the first junior class in fall of 2016.

Engineering and Industrial Technology (EIT) faculty developed a model of estimated persistence rates based on trend data of retention/success rates of the courses offered in the Electronics Technology program to predict the numbers of students in the program: 80% from freshmen to sophomore year, 85% from sophomore to junior year and 90% from junior to senior year.

A projection of enrollment during the first five years of the pilot is listed in the table below.

Five-Year Enrollment Projections for the BSIA and Number of Graduates

Academic Year	Freshmen	Sophomore	Junior	Senior	Total # in Program
2016-2017	40	30	30		100
2017-2018	40	32	26	27	125
2018-2019	50	32	27	23	132
2019-2020	60	40	27	25	152
2020-2021	60	51	34	25	170

Similar Programs at Other Colleges in Service Area

1. Are there any similar Programs in our service area? If so describe. None.

Labor Market Information and Analysis

Listed below is the analysis completed by the California Community College Chancellor’s Office to identify workforce needs supported by this degree program. It is based on OES data from the EDD-Labor Market Information Division.

College: Bakersfield				
District: Kern				
Degree: Industrial Automation				
	2014 1Q Wages¹			
	California		Kern County	
SOC Occupations	Median Hourly	Median Annual	Median Hourly	Median Annual
General and Operations Managers (11-1021)	\$50.60	\$105,248	\$43.23	\$89,933
Industrial Production Managers (11-3051)	\$47.34	\$98,467	\$53.86	\$112,039
Transportation, Storage, and Distribution Managers (11-3071)	\$41.36	\$86,034	\$40.92	\$85,107
Health and Safety Engineers, Except Mining Safety Engineers and Inspectors (17-2111)	\$46.42	\$96,548	\$40.72	\$84,701
Electrical and Electronics Engineering Technicians (17-3023)	\$30.10	\$62,605	\$38.44	\$79,946
Electro-Mechanical Technicians (17-3024)	\$23.61	\$49,129	N/A	N/A
Industrial Engineering Technicians (17-3026)	\$27.41	\$57,000	N/A	N/A
Mechanical Engineering Technicians (17-3027)	\$27.00	\$56,160	\$24.84	\$51,658
Engineering Technicians, Except Drafters, All Other (17-3029)	\$31.27	\$65,053	\$36.94	\$76,830
Sales Engineers (41-9031)	\$51.44	\$106,994	\$43.37	\$90,213
Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094)	\$27.97	\$58,187	\$33.78	\$70,269
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	\$38.69	\$80,457	\$36.01	\$74,900
Control and Valve Installers and Repairers, Except Mechanical Door (49-9012)	\$33.10	\$68,844	\$18.80	\$39,104
¹ Occupational Employment Statistics Survey 1st Quarter, 2014.				

SOC Occupations	Employment Projections ²					
	California				Kern County	
	Short-Term		Long-Term		Long-Term	
	2013	2015	2012	2022	2012	2022
General and Operations Managers (11-1021)	253,800	265,900	253,800	295,700	3,410	4,020
Industrial Production Managers (11-3051)	18,800	19,000	19,200	19,300	270	320
Transportation, Storage, and Distribution Managers (11-3071)	12,600	13,000	12,700	14,300	210	250
Health and Safety Engineers, Except Mining Safety Engineers and Inspectors (17-2111)	2,700	2,700	2,700	3,000	60	70
Electrical and Electronics Engineering Technicians (17-3023)	21,700	22,100	20,700	21,100	710	670
Electro-Mechanical Technicians (17-3024)	3,700	3,800	2,800	3,000	N/A	N/A
Industrial Engineering Technicians (17-3026)	4,500	4,600	4,200	4,300	N/A	N/A
Mechanical Engineering Technicians (17-3027)	5,100	5,200	5,300	5,500	130	140
Engineering Technicians, Except Drafters, All Other (17-3029)	8,300	8,400	8,700	9,300	580	550
Sales Engineers (41-9031)	13,500	14,400	12,800	15,300	90	90
Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094)	7,600	7,900	6,500	7,100	150	140
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	1,600	1,600	1,600	1,800	50	70
Control and Valve Installers and Repairers, Except Mechanical Door (49-9012)	4,400	4,600	3,500	3,900	80	100
² Visit www.labormarketinfo.edd.ca.gov for more projections information.						

Employer Survey

1. Describe how you determined there was a need from local employers?

In addition to the data listed above, numerous discussions with industry partners took place to determine need. Industry leaders looking to hire Bakersfield College BSIA graduates sent statements of support. These businesses include Aera Energy, A- C Electric, Kern Steel Fabrication, Dignity Health, Chevron and Paramount Farms. The local industrial automation community is strongly backing BC's plan through the local Central Section of the International Society for Automation. Industry and economic growth organizations such as the Greater Bakersfield Chamber of Commerce and Kern Economic Development Corporation support Bakersfield College's BSIA degree because it will also encourage new businesses to open operations in the region. Educators including the Kern County Superintendent of Schools and area high school Delano Chamber of Commerce, California Senators Fuller and Vidak, and U. S. Congressmen Kevin McCarthy and David Valadao, among others. BC has a dedicated webpage with statements of support from over 70

organizations. (<https://www.bakersfieldcollege.edu/baccalaureate-degree/documents-and-resources>)

List of Members of Advisory Committee

- | | |
|---------------------|-----------------------------------|
| 1. Tim DeKorte | Carboline Corp |
| 2. Walt Wiegel | American Tire Distribution |
| 3. Tunde Deru | Linn Energy |
| 4. Brian Burt | Chevron Energy |
| 5. Morgan Clayton | Tel-Tec Security |
| 6. Jonathan Geersen | Aera Energy |
| 7. Edwin Camp | DM Camp and Sons / Kern Machinery |
| 8. Adam Stephens | Lockheed Corp. |
| 9. Lisa Wong | TJ Cross Engineers |
| 10. Ron Roberts | Matrix Services |
| 11. Dick Taylor | Kern Veterans Affairs |
| 12. Blair Pruet | Kern Steel Fabrication |
| 13. Thomas Wilson | Contra Costa Elect. |
| 14. Dean McGee | KHSD |
| 15. Adam Alvidrez | Chevron, Community Affairs |
| 16. Fred Nilsen | Drill Cool |
| 17. Ron K'Miller | GAF |
| 18. Paul Niemer | Sierra Pacific Products |
| 19. Paul Blake | Taft Jr. College |
| 20. Allen Cowart | Stantec Engineering |
| 21. Ed Neilands | Chevron, Automation & Electrical |
| 22. Bill Little | Alon USA, Bakersfield Refinery |

Bakersfield College

Liz Rozell
Sean Caras
Manuel Fernandez
Jason Dixon
Roy Allard

Recommendation of Advisory Committee

Please see attached minutes.

Adequate Resources & Compliance

Library and Learning Resources Plan

The Learning Resources collection has been reviewed by the faculty originator and the librarian.

The Grace Van Dyke Bird Library is staffed with knowledgeable tenured and adjunct librarians who conduct subject-specific orientations on the use of resources and collaborate with instructional faculty in the management of acquisition of various resources required for student success. Library faculty also instruct students in the navigation and assessment of resources. This instruction is completed within groups, such as class orientations and workshops, or on an individual basis.

The following resources are currently available for course support:

- Books
- Reference Materials
- Media
- Electronic Resources

The Library at Bakersfield College offers a vast collection of resources in both print and electronic formats. Students and faculty may access the electronic resources while off campus (simply by entering their school identification number) 24 hours a day, 7 days a week, 365 days a year. The Library currently owns 100,100 books (including 11,110 electronic books) and has subscriptions to more than 100 periodicals. The Library also has online subscription access to more than 160,000 electronic books, in addition to the database provider EBSCOhost (which encompasses 26 databases), and ten independent research databases. In total, students and faculty have access to over 7,000 full-text periodicals with a large number relating to Industrial Automation:

- Applied Physics – 37
- Civil and environmental engineering – 203
- Computer Science – 188
- Electrical and computer engineering – 222
- Industrial and management engineering – 93
- Mechanical engineering – 68

The following resources are recommended for purchase to further support the course:

- Books
- Reference Materials
- Media
- Electronic Resources

Over 100 new resources—databases, technical reference books, and industry-specific periodicals—have been identified by faculty and are budgeted for purchase during the next two years. In cooperation with the Industrial Automation faculty, the Library is examining an additional database: EBSCO's *Applied Science and Technology Source*. This database will provide access to 1,350 journals and indexing for 4,000. The resources available within *Applied Science and Technology Source* include the leading trade and professional journals, applicable conference proceedings, and buyers' guides.

Facilities and Equipment Plan

Bakersfield College already has in place a number of state-of-the-art facilities that were equipped through grant funding, institutional investment, industry financial and in-kind donations, and financial support through local industry. All Electronics and Automation facilities have sufficient computers, software, and information technology resources.

Current facilities include: two fully-equipped Electronics lab rooms, containing test and instructional equipment that was purchased or built within the last ten years, including motors and controls workstations and equipment, instrumentation and process control equipment, pneumatics, fluid power, mechanical systems, industrial control, radio and telecommunications training equipment, instructor-created training equipment developed through industry collaboration; a fully-equipped Computer Integrated Manufacturing lab, containing Programmable Controller workstations, interfaced equipment to control and monitor, automation training modules, two functional Computer Integrated Manufacturing "cells" that include materials handling, automated storage and retrieval, supervisory control, and vision inspection systems; two fully-equipped

Industrial Drawing labs with current technology: AutoCAD and SolidWorks; and an Engineering Testing Lab equipped for materials science labs.

Additional facilities that will provide resources and equipment for coursework and projects include: a manufacturing lab with computer numerical controlled lathes and milling machines for project fabrication, welding and woodworking labs for fabrication, and a “design center” with laser cutting and rapid prototyping capabilities.

Space has been identified for renovation to an additional automation lab equipped with the industrial robotics necessary for the senior level courses. Planning monies have been earmarked in the general fund for designing the lab space and renovation will begin in FY 2016-2017. This should provide sufficient lab space to support the program.

Financial Support Plan

How is this Program going to be funded, general funds, grant funds?

Over the last several years, STEM and CTE programs have utilized keen business and funding models to advance student success by leveraging private philanthropy, federal grant monies, and general funds. A detailed projected budget for the eight years of the pilot program was developed and covers start-up costs and ongoing costs. The initial capital outlay of \$900,000.00, spread over the first two years, covers lab renovation and equipment purchases. Grant funding sources and donations secured to date of \$300,000 help to offset these costs. An annual budget for the balance of capital outlay costs and operating expenditures was developed and is financed by the general fund of the college.

Faculty Qualifications and Availability

Four BC full-time faculty possess the minimum qualifications and discipline knowledge (ranging from industrial automation to engineering and industrial graphics) to teach upper division courses within the program:

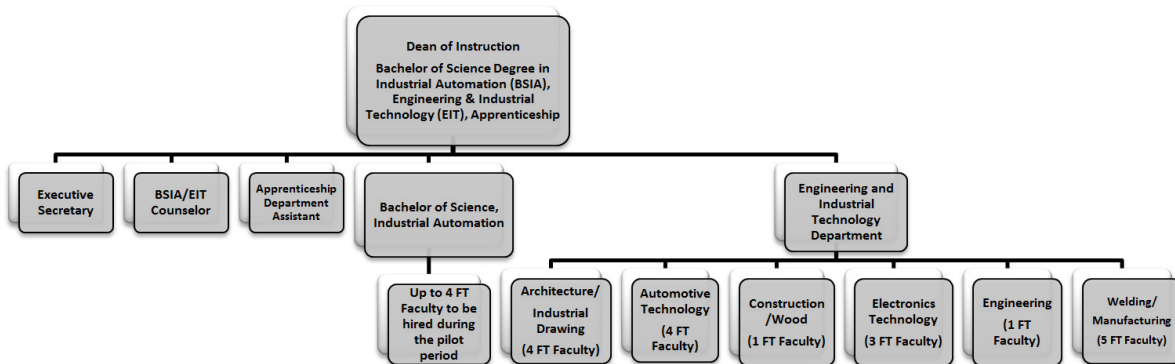
Name	Qualifications	Current Program Assignment	Area of Expertise	Upper Division Courses
Manuel Fernandez	M.S. Industrial Engineering	Electronics and Engineering	PLCs, CIM, Engineering Computer Programming	INDA 110,112, 120,122, 124, 134, 150,151
Jason Dixon	M.S. Engineering Technology	Manufacturing and Engineering & Industrial Technology Faculty Chair	Manufacturing, Engineering Graphics, Introductory Electronics	INDA 105, 114, 132, 140, 142
Klint Rigby	B.A. Industrial Technology, M.A. Education	Industrial Drawing, Wood Technology	Industrial Drawing	INDA 100, 101, 114
Patrick Aderhold	PhD Materials Engineering	Engineering	Materials Science	INDA 105
New Hire	Masters in Engineering	N/A	Expected expertise in automation and systems	All INDA courses

Coursework in the electronics program will provide the technical preparation for the upper division coursework in the baccalaureate program. Currently, the department has three full-time faculty and five adjunct faculty minimally qualified for instruction in this lower division coursework.

Over the eight year term of the pilot program, it is predicted that four additional faculty will be hired. We are currently hiring for a full-time faculty position under the minimum qualifications for engineering which requires a masters degree. The state Academic Senate for California Community Colleges will be voting on a resolution at the November plenary regarding minimum qualifications. The results of that vote will affect the minimum qualifications we require for future hires in this program.

Upper division general education courses will be taught by current full-time faculty in the English, Philosophy and Behavioral Science Departments, all of which possess masters degrees in their discipline.

In addition, the Dean of Instruction who manages the baccalaureate program possesses an M.E. in Industrial Engineering and taught engineering in the Engineering and Industrial Technology Department for over 20 years. Organization of the area is listed below.



Based on model curriculum (if applicable)

1. Is there a TMC or C-ID for the Programs/Courses. C-IDs are available for the lower division GE courses, but otherwise there are no C-IDs or a TMC for this program.

Licensing or Accreditation Standards

1. Does the program have to be regionally accredited? No.
2. Will students be required to take a state or national licensure/certification exam? No.

Student Selection and Fees

1. Are there conditions of enrollment? Yes. Applications for admittance to the BSIA program will have two tiers of acceptance:
 - *Tier One Cohort (2-year):* Scholastically qualified students prepared for official admission to the BSIA degree program.

Students will be selected for conditional admission to the BSIA program based on their scholastic eligibility determined by the following:

- 1) Accumulated 60 units of college credit.
 - 2) Completion of the Golden Four in the CSU GE Pattern (Area A2 – Written Communication (English B1a), Area B4 – Mathematical Reasoning (Math B1a, Math B2, Math B6a or higher), Area A1 – Oral Communication, and Area A3 – Critical Thinking).
 - 3) Completion of Area B1 & B3 – Physical Science (Physics B2a or higher).
 - 4) Completion of at least 32 of the 41 lower division GE requirements.
 - 5) Completion of at least 5 of the 6 lower division technical core courses.
 - 6) Earned overall GPA of at least 2.50 and an earned GPA of at least 2.50 in the lower division technical core.
- *Tier Two Pathway Cohort (3 to 4 year):* Incoming freshmen and continuing sophomore students will be admitted to a BSIA pathway cohort until they are scholastically qualified for admission to the upper division program.

Students will be selected for inclusion in the BSIA Pathway Cohort determined by the following:

- 1) Completion of Bakersfield College Orientation, Assessment, Counseling, and Abbreviated Educational Plan.
- 2) Eligible for English B1a via placement testing results or multiple measures.
- 3) Eligible for Math B1a via placement testing results or multiple measures.

Admittance to the BSIA Pathway Cohort requires that students meet regularly with the BSIA counselor to develop and update a detailed educational plan, attend BSIA information sessions and orientations, and participate in supplemental learning activities, if needed.

2. Will there be associated materials fees with the courses/program? Only one course – INDA B105: Materials Science for the Technician. Fees will cover the cost of consumable materials used in destructive property testing.

**Bakersfield College
Advisory Committee Meeting Minutes
Industrial Automation Baccalaureate Degree
June 19, 2015**

The meeting was held at La Costa Mariscos, 3401 Chester Avenue, Suite B and scheduled from 11:00am to 1:00pm.

The following were in attendance:

Lisa Wong – TJ Cross Engineers
Tim DeKorte – Carboline Corp
Paul Niemer – Sierra Pacific Products
Dean McGee – KHSD
Bill Little – Alon USA, Bakersfield Refinery
Tunde Deru – Linn Energy
Jonathan Geersen – Aera Energy
Beth Vaughn – GAF
Ron K'Miller - GAF
Thomas Wilson – Contra Costa Electric
Dick Taylor – Kern Veterans Affairs
Adam Alvidrez – Chevron, Community Affairs
Edwin Camp – DM Camp and Sons / Kern Machinery
Wayne Chiniche – Matrix Services
Ron Roberts – Matrix Services
Liz Rozell – BC, Dean of Instruction
Jason Dixon – BC, Department Chair
Sean Caras – BC, Faculty
Manuel Fernandez – BC, Faculty
Roy Allard – BC, Faculty

Blair Pruett called the meeting to order at 11:15am. Blair announced that we were here to help with the BS degree and influence student's education in a technical field in our community. Blair thanked everyone for volunteering their time and for attending the first committee meeting. Blair gave his background information to the group and how he became part of the advisory committee. Liz Rozell introduced herself and the BC faculty present and thanked the members for their attendance. Liz asked the industry members to introduce themselves and informed the group why they wanted to be partners with BC and be part of the BS committee. The members introduced themselves and several members indicated that they have difficulty finding and recruiting technical employees.

Blair asked Dean McGee from Kern High School District to communicate what the district is doing. Dean informed us of the CTE type training KHSD is trying to bring back to the high schools as there are students that require hands-on type training. KHSD plans to expand CTE facilities across the district. KHSD graduates ten thousand students each year. KHSD is working to identify student pathways so their graduates will have multiple options for their future career and education goals.

Blair asked Adam Alvidrez to speak to the group on what Chevron is doing. Adam told us they started to work with Project Lead the Way four years ago. Chevron's goal in Science Technology Engineering and Math (STEM) education is to produce future employees and engineers for their company. Project Lead The Way (PLTW) is the nation's leading provider of K-12 STEM programs. As a 501(c)(3) nonprofit organization, they deliver PLTW programs to more than 6,500 elementary, middle, and high schools in all 50 states and the District of Columbia.

Sean Caras presented an overview of the of the BS degree. Sean showed a video from Sonya Christian our BC President as she was unable to attend the meeting. BC is rated number one statewide in Alumni Earnings.

Sean reviewed the background of the state Bachelor program. He provided committee members with a binder containing information on the BS degree including course outlines of existing lower division courses and new upper division courses that will be developed. The new course outlines are subject to revision as the course content is being created. Sean explained the Electronics Technology and Engineering pathways. The BS degree will bridge the gap between technicians and engineers with the technologist provided by the BS degree. This includes safety and technical management with a higher level of educational background and understanding of the management processes. Some of the job titles that this degree will provide training for are included in the binder. The degree will provide a very broad depth with a strong technical aspect. There will be seventeen new upper division courses as part of this degree. The BS degree is not an engineering degree. Sean indicated bachelor degree attainment rate in Kern County is 50% of other areas in the state. We want students who are educated here to stay here as there is a great need in Kern County and the surrounding areas.

At 12:05pm we adjourned for lunch.

Jason Dixon reconvened the meeting at 12:28pm. Jason talked about the culture of safety. Safety will be emphasized in this program and needs to become second nature to the students. Blair reviewed the by-laws in brief from the binder and asked that the members review them and respond to Blair via email with questions, comments and suggested revisions. Blair announced there could be several meetings during the first year or two and then move to annual meetings once the degree is ongoing.

Jason reviewed the timeline and key points of the BS degree program. Spring 2018 will be the first graduating class. There are approximately twenty four other states where junior colleges offer bachelor degrees and that this is a pilot for the state of California.

Sean covered the short and long term needs from the binder. The needs list was to give the committee members exposure to the needs of this new program. Sean invited the members to visit the electronics labs if they have not seen them before or if it was many years ago. Jason indicated each of the 15 pilot programs in the state all meet a local need and this advisory committee is a partnership between the community, committee members and Bakersfield College.

Jason brought up the ideas that our existing students come up with and the entrepreneurial opportunity that exists. Sean reviewed the curriculum review process and how the committee members can help. Blair informed what future agendas would look like. Curriculum review will remain an agenda item going forward. Blair invited committee members to submit any future agenda items to him for future meetings.

Liz communicated the commitment the college has for this program. Liz informed the change in her duties as she will be the Dean of Instruction over Engineering and Industrial Technology and the new bachelor degree.

Liz adjourned the meeting at 12:52pm.