Bakersfield College
Program Review – Annual Update 2015

I. Program Information:

Program Name: Engineering Technology

Program Type: ☒ Instructional   ☐ Student Affairs   ☐ Administrative Service

Bakersfield College Mission: 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.

Describe how the program supports the Bakersfield College Mission:

The Engineering Technology program supports the institutional mission by providing the academic coursework and technical training to prepare students for employment in engineering technician positions. Students are not only prepared for such support positions by completing transfer level mathematics, physics, chemistry, and general education courses, but also by developing technical skill sets through specific technology coursework such as AutoCAD, SolidWorks, manufacturing, and electronics.

Historically, this program was a transfer program to four year university Engineering Technology programs. However, with the discontinuation of many Engineering Technology programs in California public universities and the low transfer rate in the program, the Engineering and Industrial Technology (EIT) Department is currently modifying the degree program to better prepare students for engineering technician positions to meet local workforce need. As a result, fewer engineering and math courses along with more technology courses will be integrated into the degree program. In addition, this updated program will fit better with the efforts to establish a Baccalaureate degree in Industrial Automation.

Program Mission Statement:

Engineering Technology is an instructional program that strives to offer effective and student-centered instruction and training in the engineering technician discipline, being sensitive to the diversity of our students, their educational needs, and career goals.

II. Progress on Program Goals:

A. List the program's current goals. For each goal (minimum of 2 goals), discuss progress and changes. If the program is addressing more than two (2) goals, please duplicate this section.

Program Goal	Which institutional goals from the Bakersfield College Strategic Plan will be advanced upon completion of this goal? (select all that apply)	Progress on goal achievement (choose one)	Comments
1. Continue to address the gaps in core indicators, Revised: Faculty are investigating female enrollment	☐ 1: Student Learning ☐ 2: Student Progression and Completion ☐ 3: Facilities ☒ 4: Oversight and Accountability ☒ 5: Leadership and Engagement	☐ Completed: _____ (Date) ☐ Revised: _____ (Date) ☒ Ongoing: __2015-16__ (Date)	Much work still needs to me completed on this goal.
2. Revise the engineering technology A.S. degree program from a transfer preparation to a technician-oriented degree	☒ 1: Student Learning ☒ 2: Student Progression and Completion ☐ 3: Facilities ☐ 4: Oversight and Accountability ☒ 5: Leadership and Engagement	☐ Completed: _____ (Date) ☐ Revised: _____ (Date) ☒ Ongoing: __2015-16__ (Date)	Proposal has been submitted to the curriculum committee, however, additional documentation has been requested.
3. Develop a collaborative summer research program with CSUB	☒ 1: Student Learning ☒ 2: Student Progression and Completion ☐ 3: Facilities ☐ 4: Oversight and Accountability ☐ 5: Leadership and Engagement	☐ Completed: _____ (Date) ☐ Revised: _____ (Date) ☒ Ongoing: __2015-16__ (Date)	A National Science Foundation collaborative grant was applied for in partnership with CSUB for which we were no selected. Other possibilities are being explored.

B. List new or revised goals (if applicable)

New/Replacement Program Goal	Which institutional goals will be advanced upon completion of this goal? (select all that apply)	Anticipated Results
	☐ 1: Student Learning ☐ 2: Student Progression and Completion ☐ 3: Facilities	

| | 4: Oversight and Accountability
5: Leadership and Engagement | |

III. Trend Data Analysis:

Highlight **any significant changes** in the following metrics and discuss what such changes mean to your program.

A. Changes in student demographics (gender, age and ethnicity).
- Gender makeup continues to remain steady with approximately 13% of the students being female.
- Age and ethnic composition closely parallels that of the entire college.

B. Changes in enrollment (headcount, sections, course enrollment and productivity).
The 2014-15 unduplicated headcount increased upward by 18% to 280.
FTES increased to 62.6 in 2014-15, up from 51.5 in 2013-14.
Last year FTES/FTEF productivity was 13.3 as a result of increased class sections, more students, and increased faculty, full-time and adjunct.

C. Success and retention for face-to-face, as well as online/distance courses.
The retention and success rates for engineering and engineering technology were 90% and 79%, respectively.

D. Changes in the achievement gap and disproportionate impact (Equity).
None.

E. Other program-specific data that reflects significant changes *(please specify or attach).* All Student Affairs and Administrative Services should respond.

IV. Program Assessment (focus on most recent year):

A. How did your outcomes assessment results inform your program planning? Use bullet points to organize your response.

Within the last 5 years, only one A.S. degree in Engineering Technology was awarded and no transfers in Engineering Technology took place. Industry partners have indicated there is an increased need for technicians with stronger science and math backgrounds who could be employed in engineering support positions. Thus, the EIT department began the process of modifying the degree to better fit the local workforce needs.

The curriculum for the AS in Engineering Technology was updated and a proposal submitted to revise the program name to "Engineering Technician". The program is built on the requisite science and math skill suggested by industry, augmented by technical courses in electronics, engineering, industrial drawing, and manufacturing.

The proposal is in of additional elements before it can be submitted to the Chancellor's Office.

B. How did your outcomes assessment results inform your resource requests? The results should support and justify resource requests.
    The EIT department is not making any resource requests at this time that directly relate to the engineering technology program.

C. How do course level student learning outcomes align with program learning outcomes? Instructional programs can combine questions C and D for one response (SLO/PLO/ILO).
    The new PLO's (and the assessments) for the revised engineering technology program are:
    1. Students will think critically and evaluate sources of information for validity and usefulness in the solving of engineering problems. Assessment: Students will utilize industrial reference manuals and catalogs to develop solutions to design projects.
    2. Students will communicate effectively in written, oral, and graphic forms. Assessment: Students will make presentations of team-designed projects and portfolios of coursework.
    3. Students will demonstrate competency of the areas of analytical and technical skills required of an engineering technician. Assessment: Successful completion of courses required for the degree. Track degree awards.
    4. Students will engage productively with various levels of industry and society by acquiring basic business and leadership skills. Assessment: Successful completion of BSAD B20 "Introduction to Business" to satisfy BC general education area D.2 and COMM B8 "Small Group Communication" to satisfy BC general education A.1.

D. How do the program learning outcomes or Administrative Unit Outcomes align with Institutional Learning Outcomes? All Student Affairs and Administrative Services should respond.

__Institutional Learning Outcomes__:
__Think:__ Think critically and evaluate sources and information for validity and usefulness.
__Communicate:__ Communicate effectively in both written and oral forms.
__Demonstrate:__ Demonstrate competency in a field of knowledge or with job-related skills.
__Engage:__ Engage productively in all levels of society – interpersonal, community, the state and the nation, and the world.

E. Describe *any significant changes* in your program's strengths since last year.
    Last year the program was taught by a combination of adjunct instructors and overload for full-time instructors. Despite this challenge the program saw an increase in students – 386 on census day versus 361 in 2013-14. This continues a positive growth trend that began in 2010-11. The number of declared majors in engineering and engineering technology has steadily increased from 485 in Fall 2010 to 734 in Fall 2014, indicating increased student interest in engineering-related studies.

Curricular Changes: Additionally, a significant curricular change to the Engineering Technology A.S. degree shifting it from a transfer degree to a technician training program has been submitted for approval. Faculty are in the process of making changes recommended by the curriculum committee in order to submit the proposal to the Chancellor's Office.

The College was selected to be one of the pilot Baccalaureate Degree Programs and will begin the BS in Industrial Automation program in Fall 2016. There will be coursework in the revised Engineering Technician program will provide a pathway by which students will fulfill admission requirements into the BSIA program.

F. Describe *any significant changes* in your program's weaknesses since last year.
No changes to report.

G. If applicable, describe any unplanned events that affected your program.

V. Assess Your Program's Resource Needs: To request resources (staff, faculty, technology, equipment, budget, and facilities), please fill out the appropriate form. https://committees.kccd.edu/bc/committee/programreview

Human Resources and Professional Development:
1. If you are requesting any additional positions, explain briefly how the additional positions will contribute to increased student success. Include upcoming retirements or open positions that need to be filled.
None requested.

2. Professional Development:
   a. Describe briefly the effectiveness of the professional development your program has been engaged in (either providing or attending) during the last year, focusing on how it contributed to student success.
   In June one faculty member attended an injection molding workshop to gain knowledge of the plastics industry.

   b. What professional development opportunities and contributions can your program make to the college in the future?
   The faculty of this program could make presentations regarding the career opportunities and pathways that exist for students in the field of engineering technology.

A. Facilities:
1. How have facilities' maintenance, repair or updating affected your program in the past year as it relates to student success?
The condition of the manufacturing technology facilities is sufficient for the courses offered.
None.

2. How will your Facilities Request for next year contribute to student success?
   No new facilities requests.

C. Technology and Equipment:
   1. Understanding that some programs teach in multiple classrooms, how has new, repurposed or existing technology or equipment affected your program in the past year as it relates to student success?
      None.

   2. How will your new or repurposed classroom, office technology and/or equipment request contribute to student success?

   3. Discuss the effectiveness of technology used in your area to meet college strategic goals.

C. Budget: Explain how your budget justifications will contribute to increased student success for your program.
   No budget increases are being requested at this time for the manufacturing technology program. The full-time and adjunct faculty are working to plan curriculum that efficiently adds value for the College and the students without additional funding.

VI. Conclusions and Findings:
Present any conclusions and findings about the program. This is an opportunity to provide a brief abstract/synopsis of your program's current circumstances and needs.

An adjunct instructor was hired to help teach the MFGT B1AB classes during the 2014-15. This adjunct instructor is highly qualified, having 30 year experience in the manufacturing industry as a machinist, shop owner, and quality assurance manager. His expertise quickly became a valuable asset to the manufacturing program. Student response has been very positive to his industrial and technical insight.

During the 2014-15 the sole full-time instructor for the manufacturing program served his first year as department chair of Engineering and Industrial Technology. This position includes 60% release time. The EIT department has nine separate programs, each with individual needs – automotive technology, architecture, construction technology, electronics, engineering, industrial drawing, manufacturing technology, welding, and woodworking/cabinetmaking. Engineering is a transfer program while the others are classified as CTE programs with advisory committees. In addition, the college was selected in January 2015 for to offer one of the baccalaureate degree pilot programs. This degree program, a Bachelor of Science in Industrial Automation, will utilize EIT faculty and resources from the electronics and engineering program. In 2014-15 EIT offered a total of 173 class sections and generated 610.5 FTES. The 2014-15 FTEF was 54.7. Each of these statistics began an upward trend in 2012-13, which will most likely continue as interest in EIT programs increase along with increasing student populations.

Although rewarding, the duties as chair of EIT are focused on the operations of the department – within each program and the department as a whole. It has been challenging and often difficult to devote the attention necessary to foster growth in the manufacturing technology program. It would be beneficial to the program to place it under the purview of the welding program, as both programs serve the needs of local metal fabrication industry. Welding and machining are

different facets of metalworking and have a natural affinity. The welding program requires the machining course (MFGT B1AB) and the manufacturing program requires several welding courses.

The welding program review is including an initial suggestion that its program be formed into a department separate from EIT. This is proposition supported by the manufacturing technology faculty, which includes the EIT department chair. A welding/manufacturing department would have greater flexibility to grow in new strategic directions. As a result, the manufacturing technology program could again have the necessary full-time faculty to grow the program.

VII. Forms Checklist (place a checkmark beside the forms listed below that are submitted as part of the Annual Update):
☐ Best Practices Form **(Required)**
☒ Curricular Review Form **(Instructional Programs Required)**
☐ Certificate Form **(CTE Programs Required)**
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☐ Faculty Request Form   ☐ Classified Request Form   ☐ Budget Form
☐ Professional Development Form   ☐ ISIT Form   ☐ Facilities Form (Includes Equipment)

☐ Other: _____