Bakersfield College
Comprehensive Program Review

Program Information:

Program Name: Engineering Technology

Program Type: ☒ Instructional ☐ Student Affairs ☐ Administrative Service ☐ Other

> ***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.

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.

> *Instructional Programs only:*
>   A.   List the degrees and Certificates of Achievement the program offers
>   AS Engineering Technology
>   B.   If your program offers both an A.A. and an A.S. degree in the same subject, please explain the rationale for offering both and the difference between the two.
>   C.   If your program offers a local degree in addition to the ADT degree, please explain the rationale for offering both.

Progress on Program Goals, Future Goals, and Action Plans:

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 goals, please duplicate this section.

B.

Current Program Goals	Which institutional goals from the 2015-2018 Strategic Directions for Bakersfield College will be advanced upon completion of this goal? (select all that apply)	Progress on goal achievement (choose one)	Comments

1. Strengthen articulation of transfer students to the remaining CSU programs.	☒ 1: Student Learning ☐ 2: Student Progression and Completion ☐ 3: Facilities ☐ 4: Oversight and Accountability ☐ 5: Leadership and Engagement	☐ Completed: _____ (Date) ☐ Revised: _____ (Date) ☒ Ongoing: __2016-17__ (Date)	Contact BC's articulation officer and faculty at Cal Poly Pomona and CSU, Long Beach to begin developing articulation.
2. Revise the engineering technology A.S. degree program from a transfer preparation program 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: __2017-18__ (Date) ☐ Ongoing: _____ (Date)	The program will be updated to reflect C-ID engineering course descriptor changes and prepare students for transfer or employment as a technician.

C. List the program's goals for the next three years. Ensure that stated goals are specific and measurable. State how each program goal supports the College's strategic goals. Each program must include an action plan.

Future Goals	Which institutional goals from the 2015-2018 Strategic Directions for Bakersfield College will be advanced upon completion of this goal? (select all that apply)	Action Plan	Timeline for Completion	Lead person for this goal
1. Work with the Agriculture faculty to develop articulation from the engineering technology program to the Agriculture Systems Management program at Cal Poly Pomona.	☒ 1: Student Learning ☒ 2: Student Progression and Completion ☐ 3: Facilities ☐ 4: Oversight and Accountability ☒ 5: Leadership and Engagement	Faculty will meet with the BC Articulation Officer to begin the process.	May 2018	Jason Dixon
2.	☐ 1: Student Learning ☐ 2: Student Progression and Completion ☐ 3: Facilities ☐ 4: Oversight and Accountability ☐ 5: Leadership and Engagement			

Best Practices:

Programs often do something particularly well; usually they have learned through assessment – sometimes trial and error – what solves a problem or makes their programs work so well. These are often called Best Practices and can help others. Please share the practices your program has found to be effective.

> The Engineering Technology program does not have its own courses, but, instead is a composite of engineering and industrial technology courses. It is a CTE program and a transfer pathway. It represents an opportunity for BC students with an interest in engineering but also a passion to solve problems using technology and engineering theory. It was not until recently that the potential for this program was realized. Best practices to share: seek opportunities and make the most of them.

3 Year Program Analysis:
Take a look at your trend data. Provide an analysis of program data throughout the last three years (all programs should have some form of data that is used to look at changes over time) and report:

1. Changes in student demographics (gender, age and ethnicity).
- Gender makeup continues to remain steady with approximately 15% of the students being female.
- Age and ethnic composition closely parallels that of the entire college.

2. Changes in enrollment (headcount, sections, course enrollment, and productivity).
- The 2016-17 unduplicated headcount increased upward by 18% to 385.
- FTES for Engineering increased to 77.2 in 2016-17, up from 74.8 in 2015-16.
- An additional full-time faculty engineering instructor began in 2016-17. Last year FTES/FTEF productivity was 11.4 as a result of increased class sections, more students, and increased faculty, full-time and adjunct.

3. Changes in achievement gap and disproportionate impact.
   No significant changes.

4. Success and retention for face-to-face as well as online/distance courses.
   The success rate for engineering was 90% and the retention rate was 80%.

5. Any unplanned events that affected your program.
   None.

6. Degrees and certificates awarded (three-year trend data for each degree and/or certificate awarded).
   In the past three years one degree has been awarded.

7. Reflect on any changes you would like to see in your program in the next 3 years.

- The program will be updated to reflect changes in the C-ID descriptors for some of the engineering courses included in the engineering program. The C-ID descriptor for ENGR B45 has higher prerequisites than are built into the engineering technology program, so it will be deleted from the program.
- The number of students declaring engineering technology as their major increased from 67 in 2015-16 to 209 in 2016-17. The number of students interested in engineering technology is increasing. As many of the career opportunities of engineering technology bachelor degree holders overlap those of engineering graduates (see attached PDF "ET Careers"), it would serve our students to develop an articulation agreement with the engineering technology programs at CSU campuses. The CSU programs are not as impacted as engineering programs, or at all according to Cal Poly Pomona. Also, engineering technology bachelor degree holders are able to earn a professional engineers license in many states, including California (see attached PDF "California PE Licensure").

8. List degrees and certificates awarded (three-year trend data for each degree and certificate awarded). Include targets (goal numbers) for the next three years.

Full Name of Degree or Certificate	2015- 2016	2016- 2017	2017- 2018	2018- 2019	2019- 2020	2020- 2021
Engineering Technology	0	0	1	2	5	10

Resource Request and Analysis:

Resource Request		If Fulfilled, Discuss How Previous Year's Requests Impact Program Effectiveness?
Positions: *Discuss the impact new and/or replacement faculty and/or staff had on your program's effectiveness.*	☐ 1: Classified Staff ☐ 2: Faculty	
Professional Development: *Describe briefly, the effectiveness of the professional development your program has been engaged in (either providing or attending) during the last cycle*	☐ 1: Provided Professional Development ☐ 2: Attended Professional Development	

Facilities: *If your program received a building remodel or renovation, additional furniture or beyond routine maintenance, please explain how this request or requests impacts your program and helps contribute to student success.*	☐ 1: Space Allocation ☐ 2: Renovation ☐ 3: Furniture ☐ 4: Other ☐ 5: Beyond Routine Maintenance	
Technology: *If your program received technology (audio/visual – projectors, TV's, document cameras) and computers, how does the technology impact your program and help contribute to student success?*	☐ 1: Replacement Technology ☐ 2: New Technology ☐ 3: Software ☐ 4: Other_____	
Resource Request		**Discuss How Effective Request is for Student Success?**
Other Equipment: *If your program received equipment that is not considered audio/visual or computer equipment technology, please explain how these resources impact your program and help contribute to student success.*	☐ 1: Replacement ☐ 2: New ☐ 3: Other_____	

Budget: *Explain how your budget justifications will contribute to increased student success for your program. (Fiscal requests will be submitted by the faculty chair and/or area administrator.)*		

Conclusions & Snapshot:

Present any conclusions and findings about the program. This is an opportunity to provide a brief abstract or synopsis of your program's current circumstances and needs. Consider this a snapshot of your program, if someone were to only read this portion of your Comprehensive Review.

In last year's APR it was stated that the possibility of modifying the engineering technology program into a technician program, terminating at BC, was being explored. However, the number of students declaring engineering technology as their major jumped from 78 in 2015-16 to 209 in 2016-17 – a 167% increase. This could be due to more sections of ENGR B47 "Introduction to Engineering" are being offered than ever – who knows. But this represents an opportunity for BC. The renewed focus on Career Pathways can help students stay on the engineering technology pathway and identify others with similar interests. The program will be improved, without major changes, to help connect students and industry to each other.

In addition to reaching out to local industry to market the program and hopefully increase the job opportunities for our associate degree graduates, efforts will be made to develop articulation agreements with the three CSU campuses currently offering engineering technology degrees: Cal Poly Pomona, Cal State Long Beach, and California Maritime Academy. There are three other programs at CSU campuses that are structured very similarly to an engineering technology program for which our students would be well-prepared:

- BA Agricultural Systems Management, Cal Poly SLO
- BS Sustainable Manufacturing, Chico State University
- BS Aviation, San Jose State University

Articulation with all six of these programs will be pursued to provide opportunities for Bakersfield College engineering technology students.