Bakersfield College 2018-2019
Program Review – Annual Update

Program Name: Engineering Technology

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. Engineering Technology is simultaneously a STEM program, a CTE program, and a program. Students are not only prepared for such support positions by completing transfer-level coursework in calculus, physics, chemistry, and general education courses, but also by developing technical skill sets through specific technology coursework such as AutoCAD, SolidWorks, manufacturing, and electronics. BC Engineering Technology have opportunities to transfer to various universities and complete a baccalaureate degrees. Graduates of engineering technology baccalaureate programs can earn Professional Engineers licenses in the state of California.

Instructional Programs only:

A. List the degrees and Certificates of Achievement the program offers: AS in 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. NA
C. If your program offers a local degree in addition to the ADT degree, please explain the rationale for offering both. NA

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. Please provide an action plan for each goal that gives the steps to completing the goal and the timeline.

1. **Program Goal:** Strengthen articulation of transfer students to engineering technology programs at Cal Poly Pomona, Cal State Long Beach, and the California Maritime Academy. Students would be able to complete transfer coursework at the Main Campus and Delano Campus.

    List the institutional goals from the Bakersfield College Strategic Plan that will be advanced upon completion of this goal?
    Student Progression and Completion

    Progress on goal achievement:
    The EIT department chair met with the BC Articulation Officer to request initial evaluation of courses by these institutions. Soon after the EIT department chair began serving as Interim Dean of Instruction, placing this project on hold.

    Status Update – Action Plan and any link to Resource Requests: The department chair of the newly formed Engineering & Systems department will resume this articulation project during Fall 2018.

2. **Program Goal:** Revise the engineering technology A.S. degree program from a transfer preparation program to a technician-oriented degree.

List the institutional goals from the Bakersfield College Strategic Plan that will be advanced upon completion of this goal?
(1. Student Learning, 2. Student Progression and Completion

Progress on goal achievement: A curriculum proposal was submitted Spring 2018. In addition to reflecting changes in the core curriculum a list of electives for different emphases was added. Students will now have more opportunity for electives and have recommended electives for their emphasis of interest (civil, electronics, mechanical, manufacturing, industrial safety). Evaluating the transfer programs at Cal Poly Pomona, Cal State Long Beach, and the California Maritime Academy showed that this revision aligned the curriculum more closely with requirements for these programs.

Status Update – Action Plan and link to Resource Requests
The revision was not submitted in time to complete the process before the catalog deadline. This will be completed this year.

B. List new or revised goals (if applicable)
Program Goal: Develop a Certificate of Achievement in Engineering Technology which can be awarded to engineering and engineering technology students. This certificate will be achievable at the Main Campus and the Delano Center.

List the institutional goals from the Bakersfield College Strategic Plan that will be advanced upon completion of this goal?
Student Progression and Completion

Progress on goal achievement: New goal

Status Update – Action Plan and link to Resource Requests:
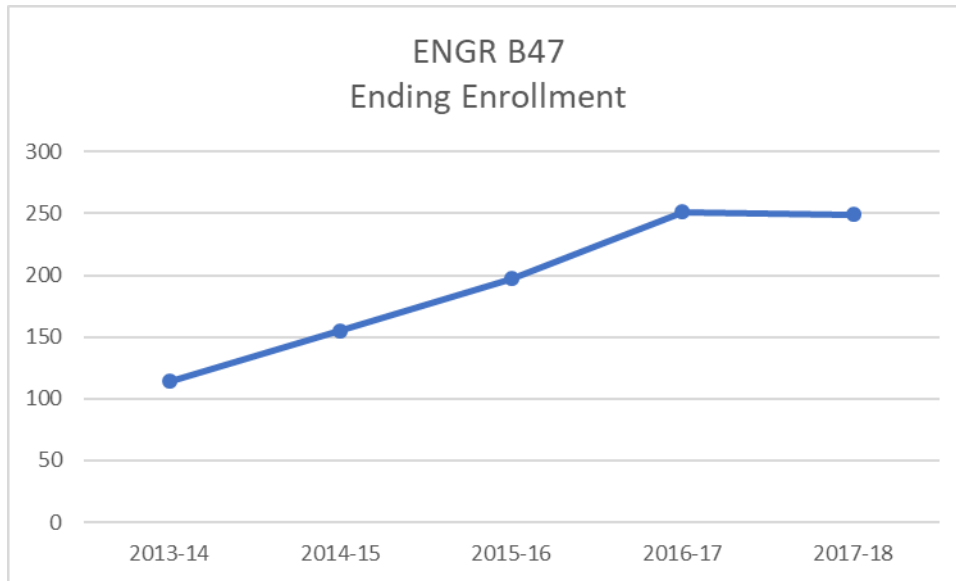
<u>Program Analysis</u>:
Take a look at your trend data (all programs should have some form of data that is used to look at changes over time). *All programs will answer the following questions unless otherwise indicated.*

1. Please report on any unexpected changes or challenges that your program encountered this cycle:
   The September 30 resignation of Engineering faculty member Kelvin Abaa resulted in a redistribution of his teaching load, along with reduced course offerings in Spring 2018. In January, the faculty member assigned to teach ENGR B24 "Engineering Graphics" assumed duties of Interim Dean of Instruction for the Spring semester. These two full sections were redistributed to other faculty in the EIT department.

2. How does your trend data (or other data your area collects) impact your decision making process for your program?
   Enrollments in ENGR B47 "Introduction to Engineering" continue to increase. This course is the gateway course for engineering and engineering technology students alike. As these enrollments increase there will likely be students who are more interested in the hands-on aspect of engineering technology. The apparent plateau in the graph below is most likely due to the personnel issues mentioned in the previous question, which affected capacity for students.

ENGR B47
Ending Enrollment

3. Evidence of Department Dialog of data
   o Several informal face-to-face discussions have taken place in which increasing enrollments have been discussed, but nothing documented.

4. Were there any changes to student demographics (age, gender, or ethnicity) for the past cycle?
   Age: The percentage of students 19 and younger increased to 45% in ENGR classes.
   Gender: The percentage of female students has increased from 13% in 2013-14 to 18% in 2017-18.
   Ethnicity: The ethnic make-up of students in engineering classes closely parallels that of the entire college.

5. Were there any changes to student success and retention rates for face-to-face and online courses? (instructional only)
   No significant changes.

6. Equity gaps
   o Please look for large differences, or gaps, between top performing groups and others. Consider how you could identify the reasons behind these gaps, and if there changes that could be made to reduce them. For in depth review of equity issues, and on changes that are being made campus-wide, please refer to the current Bakersfield College Student Equity Plan.

   The retention and success rates for engineering classes exceed those of the college, except for the success rate for African American students. The engineering success rate is 58% while the college is 55%. This statistic warrants study.

7. Please describe any recent achievements of your department, including but not limited to faculty who have won awards or distinctions, new projects your department has implemented, professional development work, professional conference presentations or recently published work.

8. The college has embarked on significant efforts such **as Guided Pathways, affinity groups** and **completion coaching communities** to improve the success and completion rates of our students. Please describe what your program/department/office is doing to contribute to these efforts.

    Engineering technology is one of only two transfer pathways in the Industrial Technology and Transfer (ITT) Guided Pathway. As the previously mentioned program revision and articulation efforts come to fruition the program will become more marketable to students and industry alike.

9. Explain your role if you are involved in Dual Enrollment, Inmate Education, or Rural Initiatives. In 2017-18 a new engineering instructor, Travis Steele, began teaching full-time with his primary assignment being the Delano Center. If CHEM B2A, PHYS B2A, and PHYS B2B are offered in Delano, it would be possible to offer the full engineering technology program, including technical electives. These students could potentially complete the AS degree and transfer to Cal Poly Pomona, Cal State Long Beach, or Cal Maritime <u>without</u> setting foot on the main campus.

Analysis of Received Resources from Previous Cycle
Discuss the type of resources you received and their Impact on program effectiveness?
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 – The INDT 205 computer lab was remodeled in summer 2017, allowing for an increase to 20 workstations equipped to teach ENGR B24.
2: New Technology
3: Software
4: Other_____

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.

Conclusion:
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 annual program review.

According to the American Society for Engineering Education: "Graduates of engineering technology programs use their math, science and engineering skills to design products and systems, install and maintain products, and provide a wide range of services, such as implementation of the design, testing, calibration and

supervision of its operation. The job of an engineer requires more theoretical, scientific and mathematical knowledge. Jobs obtained by graduates of both engineering and engineering technology programs are often similar."

Engineering Technology is engineering, with less emphasis on mathematical theory and greater emphasis on problem-solving through the application of technology. The AS in Engineering Technology is a composite program, comprised of courses from various other disciplines at Bakersfield College, including engineering. The program revision that is currently making its way through the Curriculum Committee will provide students with greater flexibility for technical electives in their area of interest.

As stated previously, the AS in Engineering Technology is a CTE program (TOP code 0924.00), a STEM program (calculus is required), and a transfer program (within California and beyond). And it would be possible to for students to complete the program and transfer from the Delano Center. Efforts were begun last fall to reach out to industry and high schools as well as establish CSU articulation, but, the role of that instructor changed in the spring semester. The project is resuming fall 2018.

This link below connects to an article providing insight to career possibilities for engineering technology graduates: http://www.engtech.org/wp-content/uploads/2016/04/Jet_Article_re_Survey.pdf

Included with this Annual Update is a PDF file with three separate documents explaining the benefits of Engineering Technology to students, employers, and institutions.