

Engineering Department Proposal

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The faculty of the Bakersfield College engineering program are formally requesting to form a new department to be under the Dean responsible for the STEM Completion Coaching Team. This change would bring increased visibility to the engineering and engineering technology programs as well as providing a more efficient reporting structure under a single dean.

Department History

The engineering and architecture programs were previously part of the Science, Engineering, and Agriculture (SEA) division. In 2008, engineering and architecture were merged with the Industrial Technology department to form the Engineering and Industrial Technology (EIT) department because Industrial Technology provided many of the resources used by those programs. Specifically:

- ENGR B47 “Introduction to Engineering” utilized the machine tool lab (room IT 7) along with the CAD labs (MS 9 & 10) for a semester-long design project. The projects for these ENGR B47 have changed, and these facilities are no longer required for the class.
- ENGR B24 “Engineering Graphics” previously had a prerequisite of INDR 12 “Introduction to Industrial Drawing & CAD” (formerly INDR B10 & B11). INDR B12 is no longer a prerequisite as it was replaced with a math prerequisite by C-ID descriptor ENGR 150 in 2014.

In 2018, EIT was reorganized into two departments due to growth of existing and new programs. These departments are:

- Engineering and Systems (ESYS) - Engineering, Automotive Technology, Electronics Technology, B.S. Industrial Automation, HVAC, and Water Technology
- Industrial Technology (INDT) - Architecture, Construction, Industrial Drawing, Manufacturing Technology, Occupational Safety & Risk Management, Welding, Woodworking

Administrative Structure

Establishing a standalone engineering department would provide a seamless administrative structure with other STEM areas would provide new opportunities for further growth of the engineering program. The ESYS and INDT departments are currently under leadership the Dean who leads the ITT Completion Coaching Team (Industrial Technology & Transportation). Except for the engineering, all the programs focused on career education. Engineering, however, is part of the STEM Career Pathway and focused on transfer preparation for the majors of engineering and engineering technology. Both programs are built not only on engineering courses, but also courses in chemistry, physics, and mathematics. This places Engineering in two separate reporting structures: one for scheduling and resource allocation, one for career pathway activities. Placing engineering under the one Dean would simplify scheduling and improve strategic planning between each of these STEM areas.

Placing engineering under the same Dean as math and the sciences would greatly facilitate interdisciplinary projects, which are often a component of STEM-related grants. It is advantageous for the College to have Engineering area under a single structure with math and the sciences provides clarity on resource allocation and administration from federal and organizational sources and industry partners. Such sources include the National Science Foundation, the Department of Energy, the USDA, the US Department of Education, Chevron, Aera, and MESA.

Priorities for the new department would include outreach and articulation. More options for students to begin their engineering education exist than ever and it is important that the engineering program increase its visibility in the community. New certificates of achievement are under development which will assist in advising

students and increase student awards for the department. These certificates will be aligned with the C-ID model curriculum for engineering. Improving existing university articulation agreements and pursuing new agreements would be also priority for the department. In 2019-20 a new articulation agreement with the CSULB Antelope Valley engineering program was established. As a standalone department there would be greater flexibility to develop additional articulation opportunities for our students.

Additionally, establishing a new engineering department would also provide visibility for the engineering technology program. For many years BC has offered an AS degree in Engineering Technology. Engineering technology is a STEM major, a CTE major, and a transfer major. In 2018 the program was revised to align with the accreditation criteria from the Accreditation Board for Engineering and Technology (ABET) to better provide students with career opportunities with AS degrees, but also better equip them for transfer. An initiative of the department would be to develop articulation agreements with the existing engineering technology programs at Cal Poly Pomona, CSU Long Beach, and the California Maritime Academy and with the new program at CSU Los Angeles that will open in 2022. Coursework in the engineering technology program also aligns with several other technology programs in the CSU System under other titles with potential for articulation:

- BS in Aviation at San Jose State University
- BS in Agricultural Systems Management at Cal Poly SLO
- BS in Industrial Technology and Packaging at Cal Poly SLO
- BS in Construction Management at Chico, East Bay, Fresno, Long Beach, Northridge, Sacramento, San Diego, Cal Poly SLO

Engineering Faculty Chair

The current faculty chair of the Engineering and Systems department would become the faculty chair of the new engineering department. According to the most recent data available from KCCD Institutional Research the census enrollment and FTES for engineering courses has been trending upward prior to 2020. Realignment with the math and science departments would provide new opportunities for strategic growth of the engineering program. 8.27 FTEF would translate to 0.3 reassigned time for the new faculty chair (see figure 1).

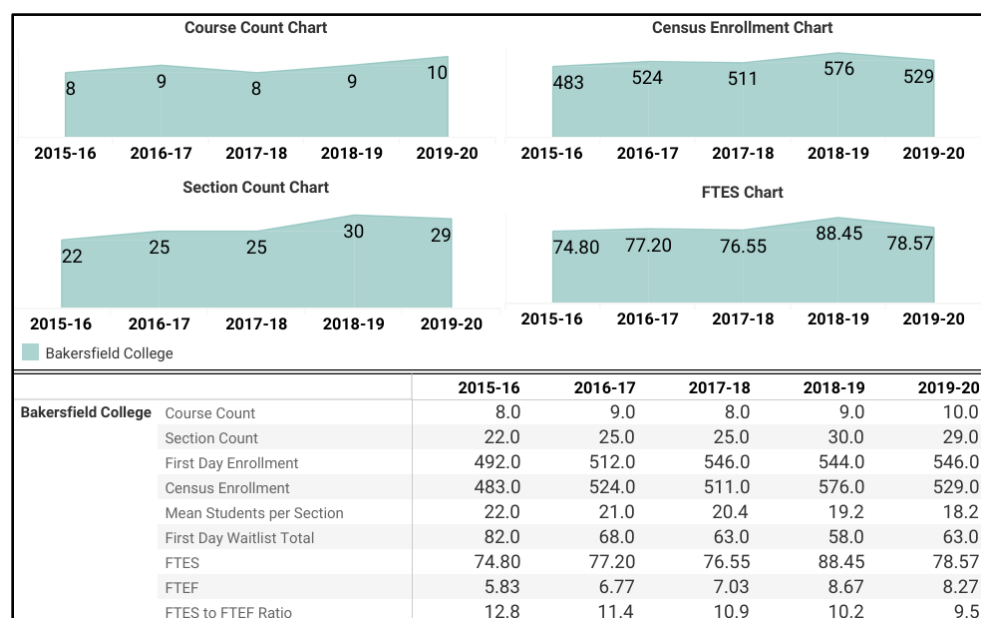


Figure 1 Engineering Program Review Data

In terms of FTES and FTEF this department would be the smallest of the areas under the Dean responsible for math and the sciences, and the smallest at Bakersfield College. However, the FTES/FTEF productivity ratio for all engineering courses has been higher than that of the EMLS department for the past five years (see figure 2). The visibility gained by an engineering department has the potential to result in increased enrollments.

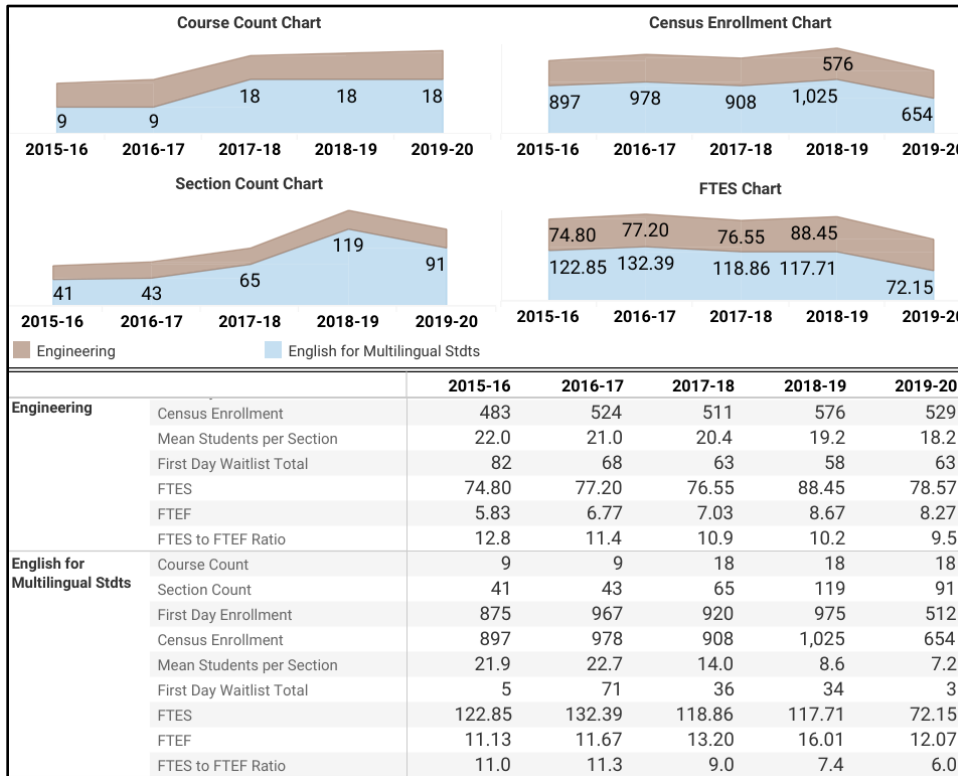


Figure 2 Comparing Engineering to EMLS data

Regarding Automotive, Electronics, Industrial Automation, and HVAC

The other programs from ESYS – Automotive Technology, Electronics, Industrial Automation (Baccalaureate), and HVAC – would remain as a department. Each of these programs are seeing upward trends growth, as shown in figure 3. Each program has ongoing growth initiatives. A new chair would need to be elected for this yet-to-be named department would receive 0.7 reassigned time based on 26.69 FTEF indicated in Institutional Research data.

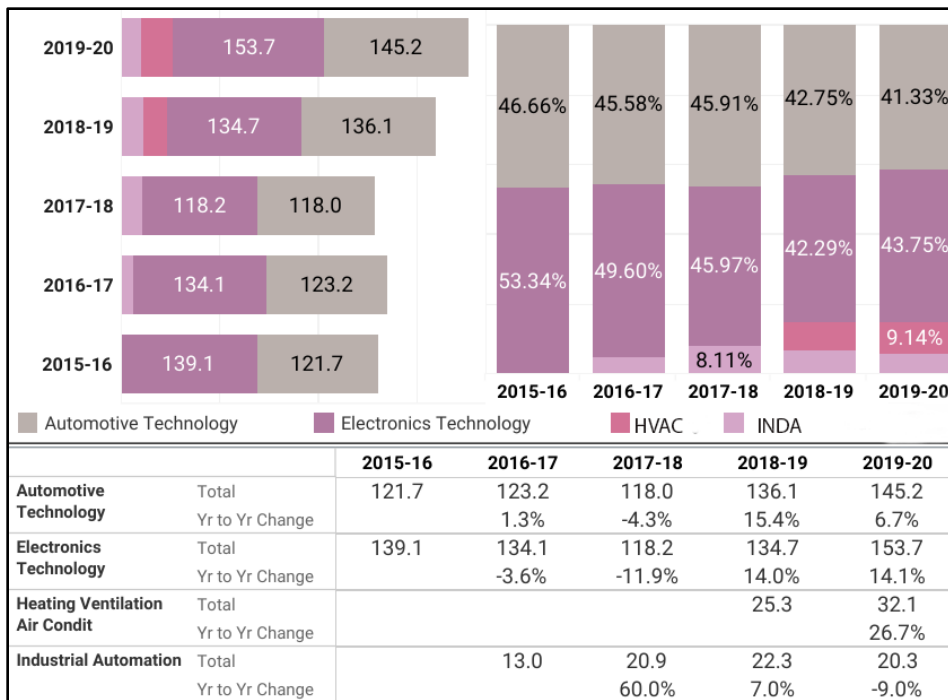


Figure 3 - FTES Growth in Automotive, Electronics/Industrial Automation, and HVAC

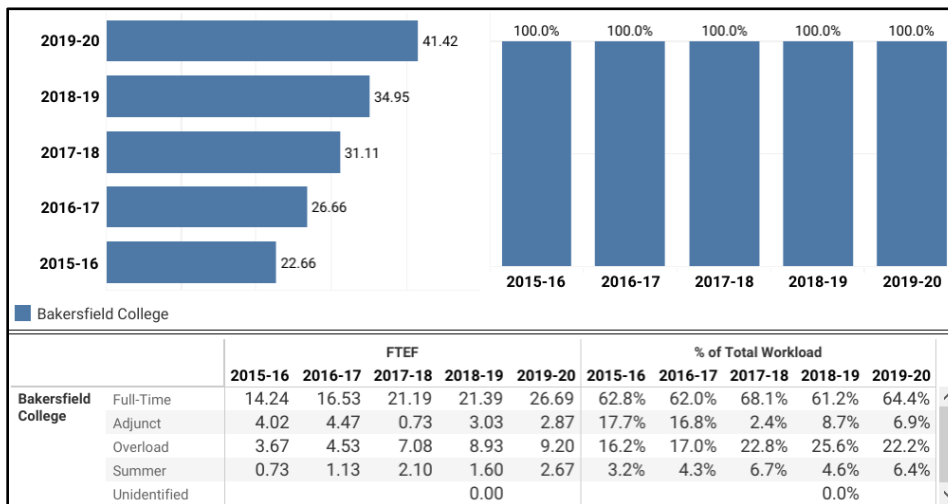


Figure 4 - FTEF Growth - Automotive, Electronics, & HVAC

Conclusion

Since the engineering program is built on courses in math and the sciences and is part of the STEM Learning Pathway, it would provide for more efficient planning and use of resources to establish a new engineering department under the Dean responsible for math, the sciences, and the STEM Completion Coaching Team. A new engineering pathway would also bring increased visibility for the program and increased growth potential.