Bakersfield College 2018-2019
Program Review – Annual Update

Program Name: Manufacturing 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 Manufacturing Technology program at Bakersfield College provides training in the use of machine tools for production. Students learn the proper and safe use of lathes, milling machines, drilling machines, band saws, grinders, and measurement tools in cutting operations to produce precision parts from metal stock. Training is provided in the use of manually controlled machine tools as well as computer numerical control, or CNC, machine tools. The courses are designed to meet the training needs of local industry. The most significant local industries utilizing machinists include the petroleum, agriculture, and aerospace. Students enrolling in the Manufacturing Technology courses include students majoring in manufacturing, welding, electronics, and engineering. There are four course under the title "Manufacturing Technology": MFGT B1AB "Machine Tool Processes", MFGT B55 "Intermediate Machine Tool Processes", MFGT B2 "CNC Lathe Programming", and MFGT B3 "CNC Milling Machine Programming". Student's can find gainful employment after (or even while) taking any one of these courses, whether or not they complete the entire degree or certificate of achievement.

The IT faculty and staff strive to offer effective, up to date and student-centered instruction, being sensitive to the diversity of our students, their educational needs, and their career goals. We provide relevant course and lab work geared toward day and night students seeking careers in IT related fields, while also meeting the needs of students seeking training for career advancement or skills updating. We use a multi-dimensional approach in preparing our students not only for their specific career goals, but also provide activities that assist them with meeting their personal, academic, and intellectual goals. Our faculty actively pursues professional development, program/facilities improvement, and college/community involvement, seeking partnerships and collective efforts.

Instructional Programs only:

A. List the degrees and Certificates of Achievement the program offers

Program Degree's: Industrial Technology, Manufacturing Technology Option - Associate of Science Degree

Program Certificates: Basic Machine Tool Operations Lathe, Mill - Job Skills Certificate (JSC), Computer Numerical Control Programming - Job Skills Certificate (JSC), and Manufacturing Technology Certificate of Achievement (CA)

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**.

Only AS offered.

Program Goals:

1. **Program Goal:**

   1. Updating program outcomes to be specific and measurable to enable program planning based on assessment results. The Bakersfield College Strategic plan that will be advanced by the completion of this goal is Student Progression and Completion, and Oversight and Accountability.

   Progress on goal achievement: Ongoing since 5 - 2018

   Status Update – I was hired during the 2016-2017 academic year, and have begun the assessment of our program's opportunities, started the process of documenting what should and will be updated during the next cycle.

2. **Program Goal:**

   2. Develop additional, more advanced manufacturing courses in manual machining, and in CNC machining, which will support the Bakersfield College Strategic plan in the areas of Student learning, and Student Progression and Completion.

   Progress on goal achievement: Ongoing since 5 - 2018.

   Status Update –

   An Intermediate level Machine Tool Processes course was re-developed, submitted, and Approved – The Course is set to offered spring 2019.

- new or revised goals

Program Goal:

1. Develop a new fabrication program integrate machining and welding technology together to prepare students for careers in the food industry and technical entrepreneurship. The institutional goals that will be advanced under the Bakersfield College Strategic Plan are: Student Learning, Student Progression and Completion, Facilities, Leadership and Engagement

Progress on goal achievement: Completed – 5- 2018

Status Update –

The Fabrication Program (AS) option was developed, submitted, and approved. Facilities, Capital equipment, and additional staffing must be provisioned ` to move program to next stage.

Program Goal:

2. Develop program attributes that support obtaining (NIMS) National Institute for Metalworking skills Accreditation. Become a (NIMS) testing center. The institutional goals that will be advanced under the Bakersfield College Strategic Plan for this goal are: Student Learning, Student Progression and Completion, Facilities, Leadership and Engagement.

Progress on goal achievement: Ongoing 9-2018

Status Update –

Preparing the documentation needed for consideration of Bakersfield College to support Accreditation under the (NIMS) National Standard. Plan to have a forward path, and required resources established by next cycle.

Program Analysis:

Take a look at your trend data (all programs should have some form of data that is used to look at changes over time).

1. **Please report on any unexpected changes or challenges that your program encountered this cycle:**

The unexpected changes or challenges experienced this cycle were few. A great deal of time was spent fixing, and cleaning equipment in Lab to provide for best student learning experience. In addition, due mostly to the lack of "not"

having enough machine tools available for specific Lab activities, several students dropped out because they didn't like waiting. 21 students working in a lab equipped to support activities for 10-12 students presents a challenge.

2. **How does your trend data (or other data your area collects) impact your decision making process for your program?**

The trend data show an increase in unduplicated headcount from 72 in 2013-14 to 115 in 2017-18. Many of these students have asked that more advanced courses be offered, and that newer technologies be used as part of the new course offerings.

3. Evidence of Department Dialog of data

If you have had time to review and discuss your program's data with members of your department, attach documentation of your discussion. Documentation can come in the form of minutes from meetings or retreats, email dialog or any other ways that show substantive discussion. No dialog documented regarding program data changes, as it was my first cycle.

4. **Were there any changes to student demographics (age, gender, or ethnicity) for the past cycle**?

No significant changes

5. **Were there any changes to student success and retention for face-to-face, as well as online/distance courses?**

The overall retention and success ratings were 87% and 72%, respectively. Retention was down slightly (1%) from the college wide rate at 88% for the cycle, but the success ratings were higher than college wide rate of 70%.

6. **Equity gaps**

No equity gaps to report

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.

Faculty Distinctions: Received commendation and recognition during first mode A evaluation for specific subject matter "knowledge" related to the field Manufacturing & Machining.

Department Implementations: New Manufacturing Fabrication Program option developed & Approved, Expanded Intermediate Machine Tools Processes course re-developed, submitted and approved.

Professional Development Work:

Completed - ASCCC PDC Curriculum 101 Course **(**Curriculum development)

Completed - Faculty Online education Training course (Developing online centered curriculum)

Completed - Intermediate Canvas for Instructors Training Course (Bakersfield College adopted course web component)

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.

I've attending some of the Guided pathways meetings, read disseminated communications, and have discussed guided pathways & degree completion coaching with my students to inform them of the resources available to them.

9. **Explain your role if you are involved in Dual Enrollment, Inmate Education, or Rural Initiatives**.

I currently take part in dual enrollment agreement with Arvin high school, which is dual enrolled with our MFGT B1AB course. I meet once a month with the instructor at Arvin, and work with them to ensure their curriculum is staying consistent, and is meeting our aligned objectives.

Analysis of Received Resources from Previous Cycle

Discuss the type of resources you received and their Impact on program effectiveness?

Facilities: No facilities resources added from previous Cycle

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?

CAD-CAM Software was purchased in the previous cycle. The Result was that the students got learn (up-to-date) methods and tools on fully operational Software vs. getting instruction on limited, outdated software that companies in industry have likely moved on from.

Other Equipment:

A CNC milling Machine was procured through Strong Workforce Grant, but has yet to be installed. Installation is planned for later this cycle.

Conclusion:

Assessment Current & Future state of BC Manufacturing Fall 2018

Scope: To provide summary of current BC manufacturing program offerings from the perspective of equipping students for careers in the Manufacturing & Metal cutting industries.

Program Overview:
The Industrial Technology's program at Bakersfield College offers three specific courses in support of its AS in Industrial Technology/Manufacturing degree. These course options range from the introduction to manual machining, to the more advanced computer numerical controlled (CNC) machining courses. Each is aimed at building those basic fundamentals required for entering industry directly, or to provide additionally perspective while trying to obtain a degree in one of the other program tracks.

Within the MFGT- B1AB -Machine tool Processes course a student learns the tools used for metal cutting, various manufacturing methods & processing types, and the safe & proper application of those methods. Students learn basic machine setup & operation, and how to safely produce consistent & repeatable results using metalworking equipment. Upon completion of Machine Tool Processes courses, a student understands those machines used, and are able to demonstrate basic capabilities.

Within the more advance MFGT – B2 / B3 courses, a student learns the coded language used to automate the machining process, which equipment types are used, and how to create coded programs for use to make parts on computer numerically controlled machines called (CNC's).

Current State:
At present, all machining courses offered are limited in their ability to completely equip a student to enter the workforce. Even with updated curriculums and a newer in-class & online instructional platforms, our programs still fall far short of meeting industry needs in the following categories: (relevant equipment & tools exposure). Our lab is comprised of mostly non-industry standard equipment, older tired machinery, and obsolete tools. The lab's machines create serious challenges in equipping students for a direct hire placement within local & regional markets. How can students expect that their skills are current when the equipment they are

learning on is 20 to 60 years old? Thus, preventing instruction of key skills & advancements that are essential to excel in today's manufacturing industries.

Future Proposed State:
Invest in the needed lab equipment, and provide for best opportunity to achieve SLO's, PLO's, and ILO's. It's understood that our costs as an institution are many, and that those costs are on the rise every year, but if the institution does not invest in its equipment upkeep, or in new emerging technology, the program limits its potential, and ability to adequately adapt and equip its students. Recommendations have been made for equipment, and additional money has been granted through Strong workforce and CCPT2 to replace a couple pieces of equipment, but this does not encompass the entire monetary need of the program.

Summary:
In summary, the lab at BC is crudely outdated and in need of a significant overhaul. The investment is significant, but represents an investment in providing 21st century skills and capabilities to our students, and to the future workforce. Such an investment would enable us to prepare students effectively for rapid job placement, and ensure that they are learning those skills and technologies that will support their continued growth for many years to come.

Advancements would aid with partnering with our adjacent programs: Industrial Automation, Electronics, and Industrial Fabrication. The exposure and cross departmental collaboration a well setup lab could support a much needed and manufacturing environment for real world focused, relevant training.