

Bakersfield College

Program Review – Annual Update

Attachments (place a checkmark beside the forms listed below that are attached):

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| <input type="checkbox"/> Faculty Request Form | <input type="checkbox"/> Classified Request Form | <input type="checkbox"/> Budget Change Request Form |
| <input checked="" type="checkbox"/> ISIT Form | <input type="checkbox"/> M & O Form | <input checked="" type="checkbox"/> Best Practices Form (Required) |
| <input type="checkbox"/> Other: _____ | | |

I. Program Information:

Program Name: **Industrial Drawing (Engineering and Industrial Technology Department)**

Program Type: Instructional Non-Instructional

Program Mission Statement:

The EIT 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 EIT related fields, 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.

Program Description: Describe how the program supports the mission of Bakersfield College

Career Technical Education (CTE) is one of the stated missions of the California Community College system. All types of construction, manufacturing, production, and engineering use drawings to communicate ideas through graphic communication. This program introduces the student to common conventions in the field and develops indispensable skills in:

- **basic drafting techniques**
- **creating appropriate graphic solutions**
- **employing principles of design**
- **increasing productivity through effective use of computer aided drafting (CAD)**

Some classes are industry specific and give advanced instruction in geographic information systems (GIS), electrical design, and piping drafting. Industrial drawing classes benefit students pursuing careers in engineering, architecture, and industrial technology. Students who receive training in our classes are prepared to enter various fields of employment, including AutoCAD drafter/designer, engineering technician, GIS technician, civil drafter, piping drafter, electrical circuits drafter, and 3D modeling designer.

Bakersfield College, as part of the California Community College system, provides CTE, transfer, and basic skills coursework. Our program successfully serves the CTE statewide goal for our discipline. In addition, we have participated in several of the strategic goals and initiatives of the college, including student success (though our participation in the C6 consortium and its activities), and fiscal sustainability through our participation in the STEM program and through sizeable grants from Chevron. Our facilities and equipment are exemplary among similar programs in the State, and as such, they have contributed both to student success and a positive example of Bakersfield College's commitment to relevant technology and high-wage, high-growth occupations within our service area.

Degrees and Certificates: List the degrees and/or Certificates of Achievement awarded by the program, if applicable.

In the 2012 – 2013 school year, the following degrees were awarded:

Engineering and Industrial Technology: Industrial Drawing emphasis

Associate in Arts: 4 degrees

Associate in Science: 1 degree

Job Skills Certificate (AutoCAD certificate): 25 certificates

II. Program Assessment:

a. How did your outcomes assessment results inform your program planning?

We created a new class, INDR 12, that will take the place of INDR 10 (Intro to Drafting) and INDR 11 (Intro to CAD). The class will basically be a combination of the two classes but will provide a seamless transition into the intermediate class (INDR 20a). In the past, we noticed that several students were not aware that both 10 and 11 were required. This new class will relieve some of the confusion and allow students to progress through the industrial drawing certificate sequence in a timelier manner.

b. How did your outcomes assessment results inform your resource requests this year?

One of our program learning outcomes states that students will demonstrate problem solving skills used in industrial design and product development. In order to add to the ways that we realize that goal, we were able to purchase (through a STEM grant) another 3D printer that will allow students to imagine, design, and build solutions to design problems. This technology is shared with the engineering and architecture students and faculty.

c. Note any significant changes in your program's strengths since last year.

- **We have opened up a Creative Design Center (CDC) where students from all classes (including architecture, engineering, and CAD) can use 3D printing technology and laser technology to prove their designs in ways that have not been previously available to students. This has also changed the curriculum in many classes, with students in all classes using the equipment to express their ideas.**
- **The addition of a new 3D printer has given us the ability to give students a new way to complete the imagine-design-build circle.**
- **We would like to purchase another 3D printer that has the capability to print in more than one material. The current technology in the CDC allows us to print in one material only. While overall proof-of-concept can be demonstrated, a printer that allows us to print in many materials will enhance this process tremendously because we will be able to print in colored plastic, clear plastic, and even rubberized plastic. This is the next logical development in the CDC.**
- **We had two instructors working with MESA Week Zero, helping to create small learning communities for our STEM students and enhance success.**
- **All of our class packs were rewritten and improved, with special attention paid to placement and pacing of exercises.**
- **We have added an additional class that teaches SolidWorks, a three-dimensional modeling program.**

d. Note any significant changes in your program's weaknesses since last year.

- **We gave up availability of MS 3-4 (one of our drafting labs) to mathematics. This has resulted in impacting our remaining drafting lab (MS 12) with very little time to move classes around. We have to be very careful when**

scheduling classes to ensure that all of our obligations are met while still allowing for open lab availability for students.

- **Our computers in MS 9 and MS 10 are now three years old. While this may seem new for a standard computer lab, in order to keep up with the demands of 3D modeling software such as Autodesk inventor, Revit, and SolidWorks, we will need to invest in new computers for this lab. The computers that are currently being used in the CAD labs may be moved to areas of need in CTE areas.**
- e. If applicable, describe any unplanned events that impacted your program.

III. Technology and Facilities Analysis

- a. Has your program received new or repurposed technology in this cycle?
- **We received a new 3D printer purchased through STEM grant money.**
 - **The drafting lab (MS 12) received a new projector and computer setup purchased through STEM grant money.**
 - i. If yes, how have you assessed the outcome of the use of that technology and its effectiveness as it relates to student outcomes?
 - **There has been no opportunity to assess the use of the new 3D printer because it just came online one week before school started. We assume that it will be similar to the success of the existing 3D printer but will offer more variety to the students regarding design output.**
 - **The drafting lab equipment has greatly enhanced our ability to demonstrate drafting techniques and concepts of creating views and pictorials that were previously impossible. Directed drawing activities have become much more effective in teaching the conventions of the industry.**
 - ii. If no, what technology could play a contributing factor in future student success and outcomes for your program? How would you evaluate the use of this technology?
 - iii. How might other areas use this technology?

We currently share all of our technology with Architecture and Engineering. Students are able to design, build, and test models in ways that were previously not available. There has been discussion of opening up our design facilities with other STEM areas with training taking place during FLEX week.

(NOTE: Technology requests can be made by filling out the [ISIT Request form](#).)

- b. Has your area received any facilities maintenance, repair or updating in this cycle? If yes, how has the outcome contributed to student success?

Yes. Our drafting lab (MS 12) has been remodeled with new white boards, new drafting desks that are appropriate for the size of the room, and a new teacher station that is situated in a way to enhance the learning experience. Students are now able to see presentations on the new BriteLink projector (something that was previously impossible in the room) and have thus improved their drawing skills. The BriteLink projector system allows us to give an overall view of what the drawing process looks like as well as being able to focus on details that were previously effective only in (very) small group demonstrations, and it is interactive and can be used to include images, video clips, and other digital media.

(NOTE: Facilities and M&O requests can be submitted by completing the [M&O request form](#))

IV. Trend Data Analysis:

Discuss any significant changes in data trends over the last year using data provided by Institutional Research. Metrics may include the following:

- a. Changes in student demographics (gender, age and ethnicity)

The only significant changes in student demographics took place in the 19 and younger and 20 – 29 age range. The 19 and younger category decreased by 33 students, while the 20 – 29 age range increased by 33 students. The overall enrollment, however, decreased only 4%, which is the exact same decrease experienced across the campus. I believe that this shows that the students in the 19 and younger category are staying with the program and that the 20 – 29 year-old students are achieving their goals and moving into employment or moving on to further their education.

- b. Changes in enrollment (headcount, sections, course enrollment and productivity)

Enrollment has remained constant in each category.

- c. Success and retention for face-to-face, as well as online/distance courses

Success and retention have remained constant over the past four years. The retention rate has fluctuated between 90.5% and 86.7% in the last five years, with the retention rate from 2012-2013 at 87.3%, which is above the collegewide rate of 85.9%. The success rate has fluctuated between 78.0% and 73.6% in the last five years, with the retention rate from 2012-2013 at 74.0%, which is also above the collegewide rate of 69.1%.

- d. Degrees and certificates awarded (five-year trend data for each degree and/or certificate awarded)

The total number of degrees awarded each year has remained fairly constant. The total number of certificates decreased in 2011-2012 and 2012-2013 because we were not able to offer the number of classes as in 2008-2009 through 2010-2011, especially the final class in the series, INDR 20b. From 2008 – 2011 we offered two sections of INDR 20b but, because of cutbacks, we now offer only one section. The demand, however, is still present. In the Fall semester of 2013 we had 22 people enrolled in the class, 10 people on the waitlist, and at least 10 more who were frustrated because they could not get on the waitlist.

- e. Other program-specific data (*please specify or attach*)

V. Progress on Program Goals:

List the program’s goals from the previous Program Review. For each goal, please discuss progress and changes. If the program is addressing more than two (2) goals, please duplicate this section.

<p>Previously Established Goal 1: (<i>state goal</i>)</p> <p>Continue to coordinate with local industry through the work of advisory boards and other collaborative efforts. [Continued goal from last year. Changes in curriculum were either made or proposed in response to feedback by advisors. Evaluation of the change will take place over the next several years]</p> <p>Progress on Goal:</p> <p><input checked="" type="checkbox"/> Completed: _____ (Date) <input type="checkbox"/> Revised: _____ (Date)</p> <p>Comments on Goal 1:</p> <p>We held an advisory committee meeting in the Spring semester that included representatives from industry, college</p>
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faculty, and local high schools. During the meeting we discussed current and proposed class offerings, certification and preparation of students, and areas where we can improve and do a better job of meeting the needs of the community. This should remain as a standing goal so that we can ensure the best service to all parties involved, including students and the business community.

Previously Established Goal 2: (state goal)

Progress on Goal:

Continue to address gaps in core indicators. [This is continued from last year – especially in terms of non-traditional student (female) enrollment.]

Completed: _____ (Date)

Revised: _____ (Date)

Ongoing

Comments on Goal 2:

Darren Willis has assumed the responsibility of being the faculty advisor for the Women in Science and Engineering club and Klint Rigby is the advisor of the Bakersfield College Engineers club, both on the Bakersfield College campus. Both clubs encourage non-traditional students to take classes in this area and become engaged in non-traditional fields of employment. Activities that encourage participation by target populations include guest speakers, design competitions, field trips, and social gatherings.

VI. Curricular Review (Instructional Programs only):

- a. List each of the courses offered within the discipline’s academic program in the first column, using one row per course. Place an **X** in the appropriate column to indicate when the course is scheduled for review.

Course	2013-2014 (2019-2020)	2014-2015 (2020-2021)	2015-2016 (2021-2022)	2016-2017 (2022-2023)	2017-2018 (2023-2024)	2018-2019 (2024-2025)
<u>INDR B10 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B11 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B12 8/2013</u>			<u>X</u>		<u>X</u>	
<u>INDR B20A 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B20B 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B40 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B42 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B50 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B51 3/2013</u>		<u>X</u>		<u>X</u>		<u>X</u>
<u>INDR B52 9/2012</u>		<u>X</u>		<u>X</u>		<u>X</u>

- b. List courses that are proposed for addition.
- c. List courses that are proposed for deletion.
- d. List any changes the program has made to online/hybrid/distance education courses.
No changes at this time – program does not use online/hybrid/distance education.

- e. Provide an update on the program's transition to adopting a [Transfer Model Curriculum](#) (AA-T or AS-T), if applicable.

Not Applicable – Program does not have a TMC.

VII. Conclusions and Findings:

Present any conclusions and findings about the program.

- 1. Increasing the number of classes we offer – especially the advanced courses – will lead to increased numbers of Job Skills Certificates awarded to our students.**
- 2. The introduction of 3D printing and the laser technology into our classes has increased excitement in our program and gives students hands-on experience with this technology that was not previously available. We believe that it will lead to equipping our students to enter the workforce and be productive at a sooner rate.**
- 3. Although growth of sections has been limited in the recent past due to budget cuts, we anticipate growth in sections and FTES from this year on. Course sections have typically been full and waitlisted in our program. We have had discussion regarding introducing Friday and Saturday classes in our department to meet the needs of the community.**
- 4. Our success and retention rates are greater than the College average. We will continue to look for ways to increase our numbers in both of these areas.**
- 5. We have had discussion in our area of including instruction in two new programs, ProE and AVEVA. It is likely that new classes in these areas will be slated for contract education. It will continue to be a challenge to meet the expectations of industry (greater breadth of knowledge required for the average technical employee) while meeting the expectations of our College program (productivity, number of sections allowed, and scheduling issues) and the limitations of our facilities for expansion.**