**Bakersfield College**

**Program Review – Annual Update**

**I. Program Information:**

Program Name:

Program Type:  Instructional  Non-Instructional

Program Mission Statement:

Program Description: Describe how the program supports the Bakersfield College Mission.

The Engineering and Industrial Technology (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 full and part time 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.

How the program supports the Bakersfield College Mission:

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 sketching and drafting techniques used every day by all levels drafters, designers, and engineers
* creating graphic solutions appropriate for the type of work being performed
* employing principles of design with an understanding of manufacturing processes
* increasing productivity through effective use of computer aided drafting (CAD)

Some classes are industry specific and give advanced instruction in 3D modeling, 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.

**II. Program Assessment (focus on most recent year):**

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

Last year we created a new class, INDR 12, which took the place of INDR 10 (Intro to Drafting) and INDR 11 (Intro to CAD). The class is basically a combination of the two classes but provides 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 relieved some of the confusion and allows students to progress through the industrial drawing certificate sequence in a timelier manner. We found that there was some initial confusion on what happened to the old classes, but this semester all sections of the new class are full and we are anticipating offering additional sections for the spring semester.

1. How did your outcomes assessment results inform your resource requests?

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) a new, upgraded 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.

1. Instructional Programs only**:** How do course level student learning outcomes align with program learning outcomes?

We have designed our student learning outcomes to support the program learning outcomes and institutional learning outcomes. Our student learning outcomes are crafted in conjunction with our advisory committees and are designed to help the students learn the most important skills needed in the workforce. Our students learn a variety of skills that vary from competency skills (using drafting and CAD programs effectively) to accessing, evaluating, and communicating new ideas and designs in a manner that is industry-appropriate.

1. How do the program learning outcomes align with Institutional Learning Outcomes?

The Program Learning Outcomes for Industrial Drawing are listed below:

1. Students will demonstrate proficiency in the technical skills required for employment in drafting/CAD related industries.
2. Students will demonstrate problem solving skills used in industrial design and product development required for drafting/CAD related positions.
3. Students will demonstrate a deep understanding of the core material required for certification in drafting/CAD.

The Bakersfield College Institutional Learning Outcomes:

Upon completion of a degree program at Bakersfield College, students will . . .

* Think critically and evaluate sources and information for validity and usefulness.
* Communicate effectively in both written and oral forms.
* Demonstrate competency in a field of knowledge or with job-related skills.
* Engage productively in all levels of society—interpersonal, community, the state and nation, and the world.

The PLOs for our area were developed in conjunction with our advisory committee in an effort to fulfill the employment needs of our economy and the lifelong learning requirements of both an ever-changing workplace and the training needs of our students.

1. Describe *any significant changes* in your program’s strengths since last year.

* Last year we 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. This year we have opened up this design center to faculty and students from other disciplines. We anticipate that the school as a whole will benefit from this change.
* 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 Science, Technology, Engineering, and Mathematics (STEM) students and enhance success.
* All of our class packs were rewritten and improved, with special attention paid to placement and pacing of exercises.
* Our Creative Design Center, where students have the opportunity to use the 3D printer and Laser, have also been introduced to other instructors in STEM areas and we are working with those instructors to leverage this technology in their classrooms.

1. Describe *any significant changes* in your program’s weaknesses since last year.

* We continue to struggle with working in classes after giving 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. We are not able to add additional classes unless we offer them at nontraditional times, such as Friday or Saturday classes.
* Our computers in MS 9 and MS 10 are now four 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 are not functioning well and the IT technicians have spent many hours in our labs in the attempt to get things working properly.* The computers that are currently being used in the CAD labs may be moved to areas of need in CTE areas with lesser computing requirements.

1. If applicable, describe any unplanned events that affected your program.

**III. Resource Analysis:**

1. Human Resources
2. If you are requesting any additional positions, explain briefly how the additional positions will contribute to increased student success.

We are not requesting any new staff.

1. Professional Development
2. Every year we send two members of our department to an industry-oriented convention called Autodesk University. Last year the two faculty who attended were able to update industry certifications and learn new practices from leaders in industry. We are able to bring the things we learn and apply them immediately in the classroom. Additionally, local employers count on Bakersfield College to provide the latest in training for the drafting, CAD, and modeling programs used by industry.
3. We must continue to provide the annual training to our faculty. Autodesk University is the best source for this training (both fiscally and logistically) and our business partners expect us to continue to attend so that we can provide the best training possible.
4. Facilities (M&O requests can be submitted by completing the [M&O request form](https://committees.kccd.edu/sites/committees.kccd.edu/files/Copy%20of%2012%20M%26O%20Needs%20Workbook%2012-13%20APR.xlsx).)

Has your area received any facilities maintenance, repair or updating in this cycle?

No.

1. Technology (Technology requests can be made by filling out the [ISIT Request form](http://www.bakersfieldcollege.edu/irp/Annual%20Program%20Reviews/2012-13/13%20ISIT%20Priority%20Workbook%2012-13.xlsx).)
2. Has your program received new or repurposed technology in this cycle?
   1. Yes. One of the 3D printers we use in our Creative Design Lab was moved to Delano to support their budding program in engineering. It was replaced (through STEM grant funding) with a new, larger 3D printer. The new 3D printer has greater capacity, but otherwise is not much different from the previous printer.
3. Do you need new or repurposed classroom technology to support student success and/or new office technology to support faculty/staff success?

We are in desperate need of new computers in the MS9 and MS10 computer labs. The current computers do not have the computing capability or the memory to handle the latest release of the software we teach. It is imperative that we get new computers before the next release. The industry standard in CAD and 3D modeling also includes dual monitors. Our goal is to supply students with technology comparable to what they will have in the work environment. Dual monitors will allow students to run the CAD or modeling program on one computer and have instructional material or reference material on the other – a feature often used in business today.

We also would like to equip the MS12 lab with computers, which would allow the students taking architectural courses more access to the same technology.

1. Budget (Changes to the budget allocation can be requested using the [Budget Change Request Form](http://committees.kccd.edu/bc/committee/programreview)).

If you are requesting any additional funding, explain briefly how it will contribute to increased student success.

**IV. Trend Data Analysis:**

Highlight *any significant changes* in the following metrics and discuss what such changes mean to your program.

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

There have been no significant changes in the student demographics for our area.

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

The number of sections we offer decreased slightly because we combined two introductory courses into one course. The overall number of students has not significantly changed.

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

We do not offer online or distance courses in this area.

1. Other program-specific data that reflects significant changes *(please specify or attach).*

**V. Progress on Program Goals:**

1. 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.

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| **Program Goal** | **Which institutional goals from the Bakersfield College Strategic Plan will be advanced upon completion of this goal?**  **(select all that apply)** | **Progress on goal achievement**  **(choose one)** | **Comments**  **(if applicable)** |
| 1. 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 advisory committee. Evaluation of the change will take place over the next several years] | 1: Student Success  2: Communication  3: Facilities & Infrastructure  4: Oversight & Accountability  5: Integration  6: Professional Development | Completed:  \_\_\_\_\_\_\_\_\_\_ (Date)  Revised: \_\_\_\_\_\_\_\_\_\_ (Date)  Ongoing: September, 2014 | Our next advisory committee meeting is scheduled for this November. We will continue to communicate with all parties and work to improve instruction. |

1. New or revised goals (if applicable)

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| --- | --- | --- |
| **New/Replacement Program Goal** | **Which institutional goals from the Bakersfield College Strategic Plan will be advanced upon completion of this goal? (select all that apply)** | **Anticipated Results** |
| Continue to address gaps in core indicators. [This is continued from last year – especially in terms of nontraditional student (female) enrollment. | 1: Student Success  2: Communication  3: Facilities & Infrastructure  4: Oversight & Accountability  5: Integration  6: Professional Development | Darren Willis is 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. We also work with the MESA program and HOPES club, each with similar goals to those stated above. **MESA enables educationally disadvantaged students to prepare for and graduate from a four-year college or university with a math-based degree in areas such as engineering, the sciences, computer science, and mathematics. HOPES is the Hispanic Organization Promoting Engineering and Science.** |

**VI. Curricular Review (Instructional Programs only):**

1. Review of Course Information:
   * Column A list all of the courses associated with the degree.
   * Column B list the Fall term the review process will be started for ongoing compliance.
   * Column C list the compliance due date.
   * Column D list any changes to courses with regard to distance education.
   * Column E list corresponding C-ID descriptors if available. <http://www.c-id.net/>

**\*\*Dates listed should reflect a five year cycle allowing for one year of review**

**to maintain ongoing compliance.\*\***

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| --- | --- | --- | --- | --- |
| **A. Course** | **B. Fall Term Review will be Submitted** | **C. Compliance Due Date** | **D. Distance Education Changes** | **E. C-ID Descriptors Available** |
| INDR B12 |  |  |  |  |
| INDR B20a | 2017 | 2018 |  |  |
| INDR B20b | 2017 | 2018 |  |  |
| INDR 40 | 2017 | 2018 |  |  |
| INDR 42 | 2017 | 2018 |  |  |
| INDR 50 | 2016 | 2017 |  |  |
| INDR 51 | 2018 | 2019 |  |  |
| INDR 52 | 2017 | 2018 |  |  |
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1. Review of Program Information:

Is the program information housed in CurricUNET accurate? (Considerations: changes in course(s) names and/or suffixes as well as additions/deletions of courses). If not, then a program modification needs to be started in CurricUNET to reflect the necessary changes. Explain the requested changes below.

All program information is accurate. We are currently working on introducing a Certificate of Achievement for Industrial Drawing that will be complete later this Fall.

Is the program and course listing information in the current catalog accurate? If not, list the requested

changes below. Catalog information should reflect what is in CurricUNET.

Course Listing in the catalog is accurate.

1. Student Education Plan (SEP) Pathway(s) uploaded to “Attached Files” in CurricUNET.

If applicable, SEP Pathway with CSU Breadth indicated? Yes

If applicable, SEP Pathway with IGETC indicated? Yes

If applicable, SEP Pathway with BC General Education indicated? Yes

Classes are not SEP applicable.

1. If applicable, provide a description of the program’s future adoption of C-ID descriptors and Associate Degree for Transfer (ADT) or Model Curricula.

There are no plans for C-ID descriptors or making an ADT for this area.  
**VII. Conclusions and Findings:**

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. We are adding an additional section of INDR 20b for the Spring semester, which will increase completions for students in this area.

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. Students are using this technology in many classes, including Industrial Drawing, Architecture, and Engineering classes.

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.

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

[Faculty Request Form](http://committees.kccd.edu/bc/committee/programreview)  [Classified Request Form](http://committees.kccd.edu/bc/committee/programreview)  [Budget Change Request Form](http://committees.kccd.edu/bc/committee/programreview)

Professional Development  [ISIT Form](http://committees.kccd.edu/bc/committee/programreview)  [M & O Form](http://committees.kccd.edu/bc/committee/programreview)

[Best Practices Form](http://committees.kccd.edu/bc/committee/programreview) **(Required)**  Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**IX. Certificates of Achievement:**

Programs with stackable certificates fill out the following form.

Stand alone certificates fill out the entire Annual Update.

**Certificate Form**

**Annual Update 2014-15**

**Name of Program:** Industrial Drawing

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| --- | --- | --- | --- | --- |
| **Certificate Name** | **JSC** | **CA** | **Is the certificate stackable?** | **Is the certificate a**  **stand alone program?** |
| Industrial Drawing CAD Certificate (Existing) | X |  | Yes | No |
| Industrial Drawing CA (Proposed) |  | X | Yes | No |
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Please discuss the following questions regarding all area Certificates of Achievement (CA):

1. Proposed Addition: CA in Industrial Drawing
2. No certificates proposed for deletion.
3. Employment information:
   1. Applicable SOC codes: 17-3010, 17-3011, 17-3012, 17-3013, 17-3019
   2. TOP code: 0953.00 - Drafting Technology\*;
   3. Students who complete the CA can expect to find jobs as: Draftsman, CAD Technician, Engineering Technician, CAD Manager, Detailer
4. We have taken the existing core classes in our area to create the CA for students who wish to gain technical expertise but do not have the need for an AA or AS degree. We are working on this in consultation with our advisory committee. We will continue to examine our program each year.
5. Our annual completion target for this CA will be twice the number of annual AS degrees. We expect about 10 per year after it has been adopted.
6. Because construction and manufacturing jobs are in constant demand, the need for drafters and designers is also in demand. We expect that the number of openings in this area will continue to grow steadily.