**Bakersfield College**

**Program Review – Annual Update 2015**

**I. Program Information:**

Program Name: Chemistry

Program Type:  Instructional  Student Affairs  Administrative Service

***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 chemistry program offers a complete two-year sequence of courses required for the career pathways of a wide variety of students. The core classes (Chem B1a/b, B30a/b, and B11) are prerequisites for the various STEM programs (e.g. physical and biological sciences, engineering, and allied health sciences). All transfer to four year institutions. Additionally, a number also serve as general education requirements and are a part of liberal studies majors’ requirements for education degrees (in particular, chem B2a and physical science B12).

Overall, a very large number of students pass through our doors as part of their journey at BC. Just within the declared STEM major crowd we are working with about 1500 students who need our courses--this does not include declared allied health majors or liberal arts/general education. Our methods involve multiple pedagogical approaches to learning styles to build students' critical thinking skills, and include a large amount of scientific writing, applied mathematics, research-styled laboratory engagement, group work, and exposure to modern research environments.

We are highly focused on student success and directly support the core values of the college. Our work in the STEM area as a whole is strongly tied to BC's current student success initiatives.

**Program Mission Statement:**

The primary mission of the chemistry program is to provide the rigorous science foundation necessary for students to acquire the skills, knowledge, intellectual curiosity and scientific literacy essential for a wide variety of careers in this rapidly changing world. The department primarily offers transfer-applicable courses designed to satisfy the needs of science, engineering, premed, architecture, and allied health majors, college general education requirements, and liberal studies teacher credential programs. Community outreach efforts comprise a smaller, yet still important, part of the work we do.

**II. Progress on Program Goals:**

1. List the program’s current goals. For each goal (minimum of 2 goals), discuss progress and changes.

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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** |
| 1. Discipline promotion | 1: Student Learning  2: Student Progression and Completion  3: Facilities  4: Oversight and Accountability  5: Leadership and Engagement | Revised: August 2015 | New specific target subgoals:  1) initiate an ACS club for students, 2) bring in outside speakers, 3) find university/ industry partners –> research. |
| 2. Improve  professional  development  through training  in areas specific  to STEM and  pedagogy. | 1: Student Learning  2: Student Progression and Completion  3: Facilities  4: Oversight and Accountability  5: Leadership and Engagement | Ongoing: August 2015 | Statewide GTS and ACS BCCE are primary targets for professional development. |
| 3. Generate two  new courses  which will help  attract GE-  seeking students  into the STEM  area, and finalize  our offerings for  transfer degrees. | X 1: Student Learning  2: Student Progression and Completion  3: Facilities  4: Oversight and Accountability  5: Leadership and Engagement | Revised: August, 2015 | The first part of this goal is being put on hold until we know our personnel status for the next year or two.  The second half has been completed, with our AS-T degree having been sent forward to the state. Hooray! |
| 4. Develop an under standing on how to use data analytics to improve student success | X 1: Student Learning  2: Student Progression and Completion  3: Facilities  X 4: Oversight and Accountability  5: Leadership and Engagement | Ongoing: August 2015 | While thought to be a good target, this lagged this year. With much activity focused on developing new profs, this may surface later. If not we will put it on freeze next year. |

1. List new or revised goals (if applicable)

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| **New/Replacement Program Goal** | **Which institutional goals will be advanced upon completion of this goal? (select all that apply)** | **Anticipated Results** |
|  | 1: Student Learning  2: Student Progression and Completion  3: Facilities  4: Oversight and Accountability  5: Leadership and Engagement |  |

**III. 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). Nothing significant
2. Changes in enrollment (headcount, sections, course enrollment and productivity). Nothing significant
3. Success and retention for face-to-face, as well as online/distance courses. Nothing significant. Seeing greater difficulties in the older sections of the population is not a surprising result. The time gap along with the difficulty of the courses unfortunately takes its toll on people who commonly have many other responsibilities than the younger crowd.
4. Changes in the achievement gap and disproportionate impact (Equity). Honestly cannot address this, as the only data available appears to be 5 year combined data with no breakdown by year.
5. Other program-specific data that reflects significant changes *(please specify or attach).* All Student Affairs and Administrative Services should respond. The nice point pulled out is the increase in chemistry majors. While 8 “ain't much” for a 5 year period, 5 of those were in the last two years, and at least 2 more are expected from last year's group. Not many data points, but we'll take anything we can get!

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

1. How did your outcomes assessment results inform your program planning? Use bullet points to organize your response.

* Most courses are proceeding as they have been for a while, as results mostly appear to be in line with our hopes.
* At least one class is undergoing relatively significant changes based on poorer than desired results. This includes a variety of sought-for improvements including greater use of classroom flipping, careful reconstruction of various elements used in the class, and continued improvement of a revamped laboratory program for the course.

1. How did your outcomes assessment results inform your resource requests? The results should support and justify resource requests.

* The primary resource that we need to expand is our yearly budget due to the growth of class enrollment in the majors pathway courses. This is mentioned as well in **V.D**, below.
* All professors would like to get relatively modern computers placed into the labs as a resource for the students. There are a number of points during the labs they perform where such a resource would be extremely valuable and help enable a more seamless environment for student learning (where there is no lag between the acquisition of information and its incorporation into specific programs for analysis, writeup, and presentation. This is mentioned as well in **V.C.2**, below.

1. How do course level student learning outcomes align with program learning outcomes? Instructional programs can combine questions C and D for one response (SLO/PLO/ILO).

This is addressed below.

1. How do the program learning outcomes or Administrative Unit Outcomes align with Institutional Learning Outcomes? All Student Affairs and Administrative Services should respond.

All of our courses have now been mapped through their SLOs into both the Program Learning Outcomes and BC's Institutional Learning Outcomes. This is being done across campus; we are just one of many who have finished the “task.” The utility of this with respect to accreditation and general public perception of the institution is well understood; it also has beneficially served to sharpen the focus of the people in the program on how our piece of the pie fits into the whole.

***Institutional Learning Outcomes***:

*Think: Think critically and evaluate sources and information for validity and usefulness.*

*Communicate: Communicate effectively in both written and oral forms.*

*Demonstrate: Demonstrate competency in a field of knowledge or with job-related skills.*

*Engage: Engage productively in all levels of society – interpersonal, community, the state and the nation, and the world.*

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

Completion of renovation, buildup of CSL, incorporation of instrumentation and reactors into curriculum, development and submission of the chemistry AS-T degree, initiation of an ACS club, hiring of two new professors allowing us to add two sections of general chemistry (the first hire simply filled in gaps from lost adjuncts and overloads),

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

See part G, below.

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

The district has refused to accept one of our new hires as a full-time professor based on visa status, despite their eligibility to work. They have made it clear that their acceptance of visa-bearing applicants extends solely to those with the standard H-1b work visa, but they also make it clear that they will not support such visas in the manner legally required of them. This is basically a Catch-22 maneuver.

The problem this raises is that our (now temporary FT) hire must hope to get a green card before such time next year where another application can be made for tenure-track status. There are always potential pitfalls here, starting from support at the upper levels of the District on down to availability of that opening. Given the current lousy environment and ill view the district has for BC at this time, we can only keep our fingers crossed.

**V. Assess Your Program’s Resource Needs:** To request resources (staff, faculty, technology, equipment, budget, and facilities), please fill out the appropriate form. <https://committees.kccd.edu/bc/committee/programreview>

1. Human Resources and Professional Development:
2. If you are requesting any additional positions, explain briefly how the additional positions will contribute to increased student success. Include upcoming retirements or open positions that need to be filled.

We will request three hires this year despite our apparent “success” last year. The net effect of these hires has been the addition of only 2 sections of classes. One of our new requests comes directly from the district issues with our second hire last year, as noted in part **IV.G**, above. It really represents the cuurent temp position becoming tenure-track. Both second and third hires this year have strong rationale based on several factors:

* We have seen immediate effects in opening up more sections of the first semester of general chemistry. A relative flood of students has ensued given the increase of 50% more people coming through the program. A large number of these need much more chemistry, and we anticipate the later classes becoming backlogged (this includes the newer chem 30a/b sequence). **We do not have the human resources to deal with this.**
* Two programs of interest to people at BC are the Ag Plant Science AS-T degree and various external Physician Assistant programs. We are getting a resurgence in interest in chem B18 for these people. This is bolstered by a growing interest in B18 as a prep class for the B30a/b sequence. Even a single section of this class cannot be touched by us at this point without invoking an extreme overload.
* BC has agreed to work with Paramount Academy in their program, which includes our providing an instructor to teach chem 2a at the academy. **This is supposed to start in 2016.** This may effectively be a full-time position by itself.
* **Significantly, the UC's have clarified as a state-wide policy** that people wishing to transfer in biological and chemical sciences must have the first two years of chemistry completed, and this is preferred over other possible classes. Students are just now becoming aware of this, so the flood mentioned above will swell even further. This is significant despite the AS-T degree's existence, since this is a call from the transfer schools for the classes. The CSU's are still fighting this pathway, and we are seeing even more students seriously consider the UC's as we work to make them aware of the financial aid available to them.
* There is interest from the outside for a biochemistry course which would open alternative pathways for students interested in programs such as Pharm. D. and related health degrees. We can develop such a class (and have the personnel to teach it now), but that is yet another drain.

1. Professional Development:
2. Describe briefly the effectiveness of the professional development your program has been engaged in (either providing or attending) during the last year, focusing on how it contributed to student success.

Our staff who attended both the statewide Great Teachers Seminar and the American Chemical Society's Biennial Conference for Chemical Educators have returned significantly rejuvenated, with an expressed renewed passion for their work. Ideas germane specifically for our students flooded in from the BCCE, and have been expressed both in material purchases made for the courses (incorporation of technological advances in lab techniques) and in pedagogical advances/changes. The GTS attendee reported a renewal of energy based on the general discussions revolving about the classroom environment. Both of these conferences are at the top of the list now for people to attend.

From last year: “An internal goal of the program is to be one of the best community college chemistry departments in the state. This necessarily requires that we be in tune with our profession's best practices. As we build specific areas of any course, or the program as a whole, these professional development opportunities become a serious, discrete informational and training component in that work.”

1. What professional development opportunities and contributions can your program make to the college in the future?

While not a topic discussed much at all up to this point, the department chair would not be surprised if people volunteer to bring forth their experiences to the department/college as a whole through seminars or the like.

1. Facilities:
2. How have facilities’ maintenance, repair or updating affected your program in the past year as it relates to student success?

The renovation of two labs has been completed. This has made a distinct impression on the students and faculty who use the labs, as the added AV technology and space/work flow improvements have redefined the students' experiences, allowing them to focus more on their work instead of clambering around one another in tight spaces. The improved whiteboard space allows significant improvement in “workshop” activities for the students and faculty as well.

1. How will your Facilities Request for next year contribute to student success?

Nothing major is anticipated at this time. Most requests anticipated are ones addressing environmental issues affecting usability of rooms (AC/heat, etc.).

C. Technology and Equipment:

1. Understanding that some programs teach in multiple classrooms, how has new, repurposed or existing technology or equipment affected your program in the past year as it relates to student success?

The computational science laboratory has already had a significant impact on students, with more classes recognizing its value in the visualization of concepts as well as having software readily available which is not found elsewhere on campus.

Technology is also addressed above in Facilites (V.B.1)

1. How will your new or repurposed classroom, office technology and/or equipment request contribute to student success?

We hope to have several repurposed computers brought into the labs. The few existing there are woefully outdated and essentially useless for the purposes we have for students.

1. Discuss the effectiveness of technology used in your area to meet college strategic goals.

This question is moot and removable. We have tied our course and program goals to the college already, and explained the critical place of tech (and other support things) in these goals. How many times do we have to explain why what we have fits the goals of the college?

D. Budget: Explain how your budget justifications will contribute to increased student success for your program.

* All our classes continue to fill. With increased student enrollment eating into resources, as well as new materials being ordered to accommodate the implementation of new approaches to teaching labs, the stockroom budget will wilt through the year. It is believed that only such an event will awaken others to the need for increases.
* Another serious issue continues to be the point about hood certification. If the district wants/expects us to keep current with issues like this then we need the finances to accomplish it.
* A last area of concern which overshadows student success from a different direction is the need for safety training specific for the sciences. This has lacked support from the district for many years. While we work with safety in mind, that dims with time in a way that we get into ruts which are hard to break out of without ongoing renewal of this important facet of teaching. We may be held liable more easily if an accident occurs and such lack of training comes to the surface.

**VI. Conclusions and Findings:**

Present any conclusions and findings about the program. This is an opportunity to provide a brief abstract/synopsis of your program’s current circumstances and needs.

**VII. Forms Checklist (place a checkmark beside the forms listed below that are submitted as part of the Annual Update):**

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

Curricular Review Form **(Instructional Programs Required)**

[Certificate Form](http://committees.kccd.edu/bc/committee/programreview) **(CTE Programs** **Required)**

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

Professional Development Form  [ISIT Form](http://committees.kccd.edu/bc/committee/programreview)  [Facilities Form](http://committees.kccd.edu/bc/committee/programreview) (Includes Equipment)

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_