The Instructional (Academic Affairs) Program Review Narrative Report

1. **College:** *Laney College*
Discipline, Department or Program: *Chemistry, Physics, and Astronomy*
Date: *November 13, 2012*
Members of the Instructional Program Review Team:
Stephen Corlett, Instructor and Chair
Pinar Alscher, Instructor
Michelle Fossum, Instructor
Allen Nicols, Instructor
Inger Stark, Dean of Math, Science and Business

2. **Narrative Description of the Discipline, Department or Program**:

The Chemistry Department offers first- and second-year college-level chemistry courses for transfer and pre-medical requirements. We also offer introductory-level courses designed for allied health programs such as nursing and dental hygiene, and which provide support to the Biomanufacturing program – a joint venture between the Biology, Chemistry and Math departments. Our introductory-level classes prepare students for our transfer-level courses. Any of our courses can be used to satisfy a laboratory science general education requirement. Many of the students in our chemistry classes intend to pursue biology, biochemistry, nursing, medicine, pharmacology, or other health fields and most of them do this by participating in some type of transfer program. All of our classes count for credit at the CSU and UC level due to the articulation agreements we have in place.

The Physics department offers courses that provide a foundation for students transferring to four-year schools in engineering and in the physical and biological sciences, as well as courses that meet general education requirements. The physics 4A/4B/4C courses are a three semester calculus-based series for engineering and physical science majors. The physics 3A/3B courses are a two semester calculus-based series for biological and medical science majors. The physics 10 course is a general education survey course and is the only Physics course without a laboratory segment.

Introduction to Astronomy (ASTR 10) is the only course offered in this discipline at Laney.

The Chemistry and Physics departments currently do not offer degrees or certificates, however all of our classes can be used for the AA degree in Natural Sciences. Recently, in response to the Star Act (SB 1440) TMC descriptors were approved for both Chemistry and Physics. This Spring 2013 we plan to develop transfers degrees (AA-T and AS-T) with Program Learning Outcomes (PLO's) for Chemistry and Physics.

We require two additional full-time instructors in Chemistry and one in Physics to provide the quality education that students deserve. We seek to provide our students continuity in their educational experience. This is not possible with part-time faculty who, regardless of their commitment to students, do not have the guaranteed employment and are at risk of not being rehired when budgets are tight. The additional full-time instructors would also serve to share in the many aspects of running the department and participating in shared governance on campus and within the district. Even though many (but not all) of our part-time faculty participate, they are under no contractual obligation to contribute in this fashion.

Along with the other core science disciplines (such as Biology and Physics) we need a new science building. Our current facilities are no longer adequate to meet the ever increasing demands of the sciences with regard to safety and effectiveness. A new science building that would allow us to grow and be in close proximity to other science departments is needed. This would allow better coordination between science departments and would allow us to easily share our resources.

3. **Curriculum**:

a. Is the curriculum current and effective? Have course outlines been updated within the last three years?

The chemistry curriculum is current and effective. We use current textbooks (updated with new information at least every 3 years) to ensure our curriculum is up-to-date. All of the course outlines for active Chemistry classes were updated between Fall 2011 and Fall 2012, with the exception of CHEM 25 which was last reviewed in Fall 2009 (this course is still active, though hasn't been taught since Fall 2009).

The curricula for all physics courses are current and effective. All courses use state-of-the-art textbooks, all instructors are familiar with current approaches to teaching physics, and students that transfer to four-year schools report that they are well prepared for their upper division work there. All of the course outlines for active Physics classes were last reviewed between Fall 2007 and Fall 2009. They are currently under review (mostly they require updating the textbooks) and will be completed by Spring 2013.

Our sole Astronomy course, *Introduction to Astronomy* (ASTR 10) is current and was last reviewed in Spring 2010.

All course outlines for Chemistry, Physics, and Astronomy include student learning outcomes (SLOs), which are also included each semester in class syllabi

b. Please indicate how many active courses are in the department inventory.

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Chemistry has seven (7) active courses – CHEM 25, although active has not been taught since 2009. Physics has six (6) active courses. Astronomy has one (1) active course.

c. How many of those have been updated in the last 6 years?

All of them.

d. If courses have not been updated within the last 6 years, what plans are in place to remedy this?

N/A

e. Has your department conducted a curriculum review of course outlines? If not, what are the plans to remedy this?

Chemistry is complete. All classes in Physics will be completed by Spring 2013. Astronomy is complete.

f. What are the department's plans for curriculum improvement (i.e., courses to be developed, updated, enhanced, or deactivated)? Have prerequisites, co-requisites, and advisories been validated? Is the date of validation on the course outline?

As mentioned, the Chemistry and Astronomy curricula are current and Physics will be completed by Spring 2013.

Our newest Chemistry course, *Chemistry and Environmental Issues* (CHEM 25) – our only course without a laboratory section – was first offered in Fall 2009, however due to lack of staffing resources has not been offered since. Our initial plan to offer this class each Fall has been stymied by budget cuts. We anticipate offering the course as soon as funds are available.

Courses under consideration for development are in the areas of Biofuels, Analytical Chemistry, and a Green Organic Chemistry course. However, the department is currently not in a position to add any other new and/or experimental courses, since any new offerings bear the risk of being cancelled due to low enrollment under the current budgetary pressures. We also lack a critical number of full-time faculty to devote time and resources to the development of new courses. We have plans, but currently have limited resources.

This Fall 2012 semester we deactivated *Beginning Chemistry* (CHEM 50).

Primarily, the changes in our course offerings over the last three years have been in reducing the number of offered sections, due to budget cuts. This is unfortunate, since we have had such an increase in the demand for our core courses. Currently, any addition to our course offering will inevitably be in meeting the demand for our core courses CHEM 30A/B, 1A/B, 12A/B and PHYS 3A/B, 4A/B/C, which means simply first adding back the section that were dropped over the last three years, then considering offering sections at new lecture and laboratory times. Past experience has shown that each new lecture and laboratory section that we offer eventually fills to capacity.

Prerequisites for all courses have been validated, and the date of validation is on each course outline.

Currently, the Chemistry discipline has initiated a district-wide implementation of an entrance exam for *General Chemistry* (CHEM 1A). Students entering this class are typically unprepared for the rigor of this college-level class, usually due to poor math skills. This class has an unusually high attrition rate and is reflected in district-wide data. Since Spring 2011 all CHEM 1A classes in the district have been collecting data on a standardized entrance exam given at the beginning of each semester and correlating students' performance. By Fall 2013 enough data will be acquired to justify implementation of the prerequisite to receive a passing grade on the exam before entering the class – preliminary data already suggest a direct correlation between their score and their likelihood to succeed.

Finally, we anticipate that given the current demand for our Chemistry, Physics and Astronomy courses and in conjunction with the construction of a new science building and the hiring of the three new full-time faculty members that we should be able to double the size of all three departments: Chemistry could serve ~2000 students/academic year; Physics could serve ~1000 and Astronomy, ~200.

g. What steps has the department taken to incorporate student learning outcomes (SLOs) in the curriculum? Are outcomes set for each course? If not, which courses do not have outcomes?

All courses in Chemistry, Physics, and Astronomy have SLO's included in the course outlines and are included in all course syllabi. We have used SLO's as a guide to drive our assessment efforts. All assessment plans and results are logged in TaskStream (www.taskstream.com).

h. If applicable, describe the efforts to develop outcomes at the program level. In which ways do these outcomes align with the institutional outcomes? (Note: <u>if</u>

your department has no certificate or degree offerings and does not offer a course as part of one of the College's associate degree programs, then skip questions 3.h. and 3.i.)

Although Chemistry, Physics and Astronomy do not have official program outcomes, we have developed tentative program outcomes in Chemistry in order to inform students of potential educational paths. They are Track A and B shown below.

Chemistry Program Outcomes
Track A: Chem 1A, 1B, 12A, 12B
Chemistry and Biology majors, pre-med, pre-pharmacy, etc.

1. Apply mathematics to solve quantitative chemical problems
2. Conceptualize, model, and explain chemical processes qualitatively at the molecular level
3. Maintain a laboratory notebook according to standard scientific guidelines
4. Extract appropriate information, analyze and synthesize experimental results to reach correct conclusions
5. Write clear, well-documented lab reports using the language of science
6. Perform laboratory techniques safely and accurately
7. Apply principles of scientific ethics and academic integrity

Chemistry Program Outcomes
Track B: Chem 30A, 30B
Nursing, dental hygiene, allied health majors

1. Apply mathematics to solve quantitative chemical problems
2. Conceptualize, model, and explain chemical processes qualitatively at the molecular level
3. Extract appropriate information, analyze and synthesize experimental results to reach correct conclusions
4. Perform laboratory techniques safely and accurately
5. Apply principles of scientific ethics and academic integrity

i. Provide one program level outcome (PLOs), and the assessment tool that will be used to measure the program level outcome this fall 2012 and spring 2013.

N/A

j. How are the SLOs and PLOs, if applicable, mapped to the college's Institutional Learning Outcomes? (*See Attachment B for copy of the Laney College Institutional Learning Outcomes (ILOs)*

All of our classes in some way align with these outcomes. Particularly the ILO of

k. Recommendations and priorities.

See Attachment C for listing of the courses in your discipline/department. If applicable, this document also lists the certificate and degree programs offered. ***<u>Be sure to check the appropriate boxes and submit completed forms as part of this Program Review</u>***.

4. Instruction:

a. Describe effective and innovative strategies used by faculty to involve students in the learning process. How has new technology been used by the department to improve student learning?

Different instructors use different methods. Among the methods used are:

1. Testing frequently to give students ample, timely feedback. (some of the tests are standardized ones from the American Chemical Society and come with statistical norms that can be used to gauge effectiveness in the classroom)
2. Interactive class sessions, where instructors constantly solicit feedback and dialogue with the students
3. Peer learning workshops in class where students participate in group problem solving sessions with the assistance of the instructor.
4. Workshops with guided feedback on how to write lab reports effectively.
5. Use of web-based chemistry problems sets.
6. Assignment of on-line homework assignments with instant performance feedback and assignment completion notification.

Since our classes are small, we are able to have plenty of personal contact with the students, especially during the laboratory periods, and are able to gauge their progress. Most of our current lecture instructors also teach the laboratory portion of their course as well.

Nearly all instructors in Chemistry and Physics have set up class websites where students can access handouts, sample exams and review problems, and other pertinent information. With the district's transition to the new WordPress platform, finally resources for both students and faculty are more readily available and easier to implement. Our departments have updated the Chemistry and Physics websites, which contain a faculty-only resource page and a blog space for chemistry students to interact with chemistry faculty. We continue to need IT support for this.

Through the use of Measure A funds we have made a reasonable amount of progress in obtaining and implementing new technology in many of our lecture and laboratory courses, particularly in the area of new computers and laboratory equipment. We purchased new desktop computers, printers and chemistry drawing software for faculty offices and some desktop computers for student use in the laboratories, of which most are also connected to laboratory instruments. The department also purchased two laptop computers and two overhead PowerPoint projectors specifically for classroom presentation and this semester just purchased audio/visual carts for these computers.

All of our faculty use molecular models for demonstration purposes in lecture and sometimes also in the laboratory. To this end, also with Measure A funds, the department purchased molecular models for students use and for lecture demonstration purposes. Several different size and type model kits were purchased.

An effective strategy to enhance student learning is to maintain small class sizes. By doing so we are able to offer personal contact with the students, especially during the laboratory periods, and are able to effectively gauge their progress. For this pedagogical reason and for safety reasons, we limit laboratory class sizes, which guarantees small manageable lecture sizes. We are currently encouraging all Chemistry departments in the district to restrict laboratory enrollments to adopt the class sizes recommended by the American Chemical Society for Two-Year College Programs (2009). The recommendation is for no more than 24 students for any laboratory session/instructor (20 for organic chemistry labs).

We are beginning to obtain newer technology in the classroom and laboratory. Some (but not all) of our classrooms have been convert to Smart classrooms with internet, audio/visual capacity. This has enhanced the ability of instructors to offer more However we don't have dedicated computers for student use.

b. How does the department maintain the integrity and consistency of academic standards within the discipline?

Every instructor teaching the same course uses the same textbook, so the content of each course is consistent. When choosing the textbook for the course, we look at the content, the readability, the types and variety of problems, and the clarity of explanations. The topics in the textbooks used always correspond to the topics listed in the course outline for each course. All instructors make sure to follow the course outline for the class they are teaching. Although in some cases other colleges in the district use different textbooks for the same courses that we teach, since the course outlines are used by the entire district, the courses at Laney are aligned with those in the district.

We monitor students carefully during exams to minimize cheating. We discourage multiple-choice exams and instead ask exam questions that require students to show their work and explain their reasoning. We make sure to cover all of the material needed for success in the following course in the sequence to maintain continuity.

We make sure to cover topics required for the MCAT and the American Chemical Society (ACS) standardized exams. Although these tests are officially multiple-choice exams, and typically discourage the use of these type of test for grading purposes, the test results can be used effectively for assessment purposes. They also give students practical experience in taking standardized exams, which they will inevitable do if they continue in science and/or health-related fields. In Chemistry, we now utilize the ACS standardized exams as tools for assessment for General Chemistry (1A/1B) and Organic Chemistry (12A/12B) and is used for some part of assigning their final grade.

In addition, the Chemistry department is currently assessing students' performance on selected test questions across all courses and all instructors for comparison purposes and to see if any improvements are needed – some of these questions are from standardized final exams and some are from essay-type problems given on mid-term exam. Comparison of results across multiple sections of the same course ensures that the department maintains consistent high academic standards.

c. Discuss the enrollment trends of your department. What is the student demand for specific courses? How do you know? Identify factors that are affecting enrollments.

The enrollment in Chemistry (see figure below) over the last three years has been essentially constant across the entire curriculum. The two factors that have lowered the overall actual enrollment during Fall 2010 and 2011 compared to 2009 are (a) the lost of an entire master section of CHEM 30A lecture and laboratory due to budget cuts and (b) our adjustment to enrollment capacities to comply with mandated room capacity limits in the lecture and laboratory classrooms. It is noteworthy that in nearly all cases all sections of our classes are enrolled to capacity on the first day of class.

I. Enrollment					
	Alameda	Berkeley	Laney	Merritt	District
Census Enrollment F09	209	214	542	262	1227
Census Enrollment F10	181	218	420	242	1061
Census Enrollment F11	194	223	443	245	1105
Sections F09	6	6	15	7	34
Sections F10	6	6	12	7	31
Sections F11	6	6	13	7	32
Total FTES F09	52.81	56.24	140.32	62.19	311.56
Total FTES F10	45.7	55.6	109.06	59.31	269.67
Total FTES F11	49.4	57.3	113.26	59.32	279.28
Total FTEF F09	3.08	2.92	7.36	4	17.36
Total FTEF F10	2.76	2.92	6.44	3.52	15.64
Total FTEF F11	2.76	2.92	6.6	3.52	15.8
FTES/FTEF F09	17.15	19.26	19.07	15.55	17.95
FTES/FTEF F10	16.56	19.04	16.94	16.85	17.24
FTES/FTEF F11	17.9	19.62	17.16	16.85	17.68

We think the two major trends that currently affect our Chemistry enrollment are (a) the huge need for nurses and other allied-health care workers and (b) students pursuing their pre-medical, pre-dental, pre-veterinary, and pre-pharmacy requirements. The increasing numbers of students have been obtaining an AA degree in Natural Sciences also contribute to our enrollment (all of our classes in Chemistry and Physics can satisfy the science requirement).

The demand for *Introduction to General Chemistry* (CHEM 30A) is driven by students taking pre-nursing classes, other allied health profession students, and students obtaining the Biomanufacturing Certificate. We have been offering 4-5 sections of CHEM 30A each semester for the past three years, and most of these sections fill early, sometimes with extra students wanting to add on the first day of school. It seems that any new sections of CHEM 30A that are added to the schedule will fill by the beginning of the semester. This semester we offered a Saturday section of lecture and laboratory that is nearly still at capacity.

Introduction to Organic and Biochemistry (CHEM 30B) has also seen an enrollment increase over the past three years. In previous years, enrollment has fluctuated. However, the recently added second section last Spring 2012 filled to capacity. We recently started offering CHEM 30B in the Fall semester in addition to the Spring semester, and it has also filled. We anticipate that by offering two sections of CHEM 30B we are closer to meeting the demand for this class.

General Chemistry (CHEM 1A/1B) is a core course offering in our department for pre-medical and transfer students. Enrollment has consistently been at capacity and has not changed significantly over the last three years. This semester we added a second section of CHEM 1B lab, and it filled to capacity by the first day.

Pre-medical and transfer students continue to generate a huge demand for *Organic Chemistry* (CHEM 12A/B). The demand for the off-sequence CHEM 12A/B is also very high (CHEM 12A in the Spring/ CHEM 12B in the Fall). Laney is one of the only remaining community colleges in the Bay Area that offers this off-sequence organic class and each semester students are turned away, due to the restricted class size. Virtually all of the off-sequence classes fill early, before the first day of class. The limitation on class size for both pedagogical and safety reasons is set by our laboratory capacity. With only one laboratory space designated for the CHEM 12A/B classes, we are at the limit of how many sections we can offer.

A major issue for the Chemistry department in meeting this increased demand in enrollments is the lack of enough laboratory space. The only way to increase enrollment for any lecture section in our department is to add an additional laboratory section, however this can lead to very overcrowded lecture classrooms. The number of laboratory sections governs the class enrollment maximums for all of our courses. The average general chemistry laboratory (used for CHEM 30A/B, 50 and 1A/1B) has a maximum capacity of 27 students (we have three general chemistry labs); the organic chemistry laboratory has a maximum capacity of 24 students. We are currently in the process of adopting the recommendations of the American Chemical Society (ACS), Division of Two-Year Colleges Guidelines and Recommendations (see attachment), in capping enrollment in each chemistry laboratory at 24 students (20 in organic laboratory). The recommendation is bolstered by newer Nation Fire Prevention Standards (NFPA) and OSHA. Since it is unsafe, unwise, and unlawful to enroll more students than the maximum capacity for each laboratory, the demand for any increase in enrollment can only be met by adding additional laboratory sections. This requires hiring more instructors. Additionally, since we are so near or capacity for adding laboratory sections, any significant strides we make in meeting the demand for increased enrollment require us to have a new science building – only then will we have enough space for an expanded program.

The enrollment increase in Physics over the same time period is the result of the increased demand of students actually filling the capacity of the courses offered. No new section were added or lost during the three period Fall 2009 to Fall 2011, however the minor scheduling adjustment made over this time period may have allowed more Physics students to enroll in needed courses, without conflicts with other courses.

I. **Enrollment**					
	Alameda	**Berkeley**	**Laney**	**Merritt**	**District**
Census Enrollment F09	28	77	250	81	436
Census Enrollment F10	105	0	268	95	468
Census Enrollment F11	111	39	287	74	511
Sections F09	1	2	5	3	11
Sections F10	3	0	5	3	11
Sections F11	3	1	5	2	11
Total FTES F09	6.53	13.76	56.67	15	91.96
Total FTES F10	20.6	0	60.06	18.55	99.21
Total FTES F11	22.09	5.21	64.84	13.76	105.9
Total FTEF F09	0.43	0.69	2.29	1.12	4.53
Total FTEF F10	1.12	0	2.26	1.12	4.5
Total FTEF F11	1.12	0.27	2.29	0.69	4.37
FTES/FTEF F09	15.3	19.84	24.72	13.39	20.30
FTES/FTEF F10	18.39	0	26.53	16.56	22.05
FTES/FTEF F11	19.72	19.54	28.27	19.84	24.23

Physics courses tend to have roughly 20% attrition during the first several weeks of the course. Typically these students have found that they either do not have adequate background for the course, or do not have the time necessary to put into the course. Many of these students return to the course after a semester or two. During the remainder of the course another 10% to 20% of students withdraw. Again, many of these students return at a later semester after completing other courses or freeing up their schedules

Students in continuing courses such as 3B, 4B, and 4C tend to complete those courses at a higher retention rate.

Enrollment in *Introduction to Astronomy* (ASTR 10) has been constant over the three year period.

I. Enrollment					
	Alameda	**Berkeley**	**Laney**	**Merritt**	**District**
Census Enrollment F09	151	80	82	51	364
Census Enrollment F10	57	0	48	61	166
Census Enrollment F11	84	53	102	47	286
Sections F09	2	2	2	1	7
Sections F10	1	0	1	1	3
Sections F11	1	1	2	1	5
Total FTES F09	13.91	7	8.49	5.44	34.84
Total FTES F10	5.7	0	4.8	6.1	16.6
Total FTES F11	8.4	5.3	10.2	4.7	28.6
Total FTEF F09	0.4	0.33	0.4	0.2	1.33
Total FTEF F10	0.2	0	0.2	0.2	0.6
Total FTEF F11	0.2	0.2	0.4	0.2	1
FTES/FTEF F09	34.78	21	21.23	27.2	26.20
FTES/FTEF F10	28.5	0	24	30.5	27.67
FTES/FTEF F11	42	26.5	25.5	23.5	28.60

d. Are courses scheduled in a manner that meets student needs and demand? Please describe the criteria and considerations used in the scheduling process.

Yes. Since our courses always fill to capacity, they must be meeting student needs and demand. We offer classes in the daytime, in the evenings, and on Saturdays. (As far as we know, no other schools in the Bay Area offer Chemistry 1B, 12A, and 12B in the evenings.) If anything, we should offer more sections of each course, but we are limited by classroom availability, laboratory space availability, our budget for supplies, and a lack of full- and part-time instructors.

In addition, Chem 1A, 1B, 12A, and 12B courses are scheduled so as to eliminate conflicts between class times for Chemistry, Biology and Physics classes. The Chemistry department consults with the other science departments at Laney to make sure that our required classes don't conflict with each other. This helps ensure that students will be able to take all of the classes they need without unnecessary delays. We also coordinate with other departments like Biology to make sure that we have courses available for students that are in special programs, such as Biomanufacturing.

All Physics courses are scheduled with other classes in mind, especially Math.

e. Recommendations and priorities.

1. We recommend the construction of a new science building with more laboratory space. We could then offer more sections of all of our courses and potentially develop and teach other types of classes (e.g, Quantitative Analysis, Green Organic Chemistry, Biofuels, Physics for Building Science).

2. Purchase additional teaching technology such as overhead (PowerPoint) projectors for classroom presentation use and more laptop computers.

3. Before completion of any science building, update lecture halls and Chemistry and Physics laboratories to accommodate newer technologies for presentations.

4. Complete the installation of equipment that was recently purchased through Measure A funds (such as gas generators for GC, water purifier and atomic absorption apparatus)

5. Offer additional sections of Chem 30A/30B, Chem 1A/1B, and Chem 12A/B.

6. Maintain the supplies budget to support additional sections. In order to adequately cover expenses we need nominally $25,000 in Chemistry and $5000 for Physics/Astronomy every fiscal year.

7. Provide more support staff in the computer IT area so that our department computer resources work more consistently and with greater security.

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5. Student Success:

a. Describe student retention and program completion (degrees, certificates, persistence rates) trends in the department. What initiatives can the department take to improve retention and completion rates?

The Chemistry, Physics, and Astronomy departments do not currently offer degrees or certificates. The Chemistry and Physics departments will be developing transfer degrees to (AA-T and AS-T's) as part of the recently announce TMC descriptors for Chemistry and Physics in the Spring 2013.

Chemistry Department Data Analysis

Below are the data for the Chemistry departments, district-wide and shows the three year trend in enrollment, number of master class sections, FTEF, FTES, and productivity (FTES/FTEF).

I. Enrollment					
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Census Enrollment F09	209	214	542	262	1227
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Sections F11	6	6	13	7	32
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Total FTEF F10	2.76	2.92	6.44	3.52	15.64
Total FTEF F11	2.76	2.92	6.6	3.52	15.8
FTES/FTEF F09	17.15	19.26	19.07	15.55	17.95
FTES/FTEF F10	16.56	19.04	16.94	16.85	17.24
FTES/FTEF F11	17.9	19.62	17.16	16.85	17.68

The success rate and withdraw rate (attrition rate) for Chemistry are shown below.

II. Student Success					
	Alameda	Berkeley	Laney	Merritt	District
Total Graded F09	193	196	489	220	1098
Total Graded F10	152	199	374	220	945
Total Graded F11	182	206	399	231	1018
Success F09	93	121	297	145	656
Success F10	90	134	251	125	600
Success F11	112	137	267	143	659
% Success F09	48%	62%	61%	59%	60%
% Success F10	59%	67%	67%	57%	63%
% Success F11	62%	67%	67%	62%	65%
Withdraw F09	86	64	145	66	361
Withdraw F10	39	51	85	64	239
Withdraw F11	56	60	100	59	275
% Withdraw F09	45%	33%	30%	27%	33%
% Withdraw F10	26%	26%	23%	29%	25%
% Withdraw F11	31%	29%	25%	26%	27%

Our retention rate of students shown below (any grade except W compared to census) is very close to the norm for the college over the past four years. The success rate of our students (any passing grade compared to census) over the same time period is slight lower than the average class at Laney.

2009 Fall

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate
ASTR		**82**	**38**	**46%**
ASTR	10	82	38	46%
CHEM		**543**	**344**	**63%**
CHEM	12A	52	42	81%
CHEM	12B	20	13	65%
CHEM	1A	165	91	55%
CHEM	1B	61	40	66%
CHEM	25	18	12	67%
CHEM	30A	173	123	71%
CHEM	30B	25	9	36%
CHEM	50	29	14	48%
PHYS		**250**	**183**	**73%**
PHYS	10	46	33	72%
PHYS	3A	70	53	76%
PHYS	4A	81	61	75%
PHYS	4B	24	12	50%
PHYS	4C	29	24	83%

2010 Fall

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate
ASTR		**48**	**40**	**83%**
ASTR	10	48	40	83%
CHEM		**420**	**289**	**69%**
CHEM	12A	50	38	76%
CHEM	12B	16	11	69%
CHEM	1A	158	92	58%
CHEM	1B	25	13	52%
CHEM	30A	143	112	78%
CHEM	30B	28	23	82%
PHYS		**268**	**219**	**82%**
PHYS	10	41	32	78%
PHYS	3A	76	60	79%
PHYS	4A	82	68	83%
PHYS	4B	32	23	72%
PHYS	4C	37	36	97%

2011 Fall

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate
ASTR		**102**	**80**	**78%**
ASTR	10	102	80	78%
CHEM		**443**	**299**	**67%**
CHEM	12A	48	38	79%
CHEM	12B	20	16	80%
CHEM	1A	141	75	53%
CHEM	1B	36	31	86%
CHEM	30A	161	113	70%
CHEM	30B	37	26	70%
PHYS		**287**	**222**	**77%**
PHYS	10	40	34	85%
PHYS	3A	73	51	70%
PHYS	4A	97	77	79%
PHYS	4B	38	29	76%
PHYS	4C	39	31	79%

2009 Fall

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate
ASTR		**82**	**38**	**46%**
ASTR	10	82	38	46%
CHEM		**543**	**344**	**63%**
CHEM	12A	52	42	81%
CHEM	12B	20	13	65%
CHEM	1A	165	91	55%
CHEM	1B	61	40	66%
CHEM	25	18	12	67%
CHEM	30A	173	123	71%
CHEM	30B	25	9	36%
CHEM	50	29	14	48%
PHYS		**250**	**183**	**73%**
PHYS	10	46	33	72%
PHYS	3A	70	53	76%
PHYS	4A	81	61	75%

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate
PHYS	4B	24	12	50%
PHYS	4C	29	24	83%

2010 Fall

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate
ASTR		**48**	**40**	**83%**
ASTR	10	48	40	83%
CHEM		**420**	**289**	**69%**
CHEM	12A	50	38	76%
CHEM	12B	16	11	69%
CHEM	1A	158	92	58%
CHEM	1B	25	13	52%
CHEM	30A	143	112	78%
CHEM	30B	28	23	82%
PHYS		**268**	**219**	**82%**
PHYS	10	41	32	78%
PHYS	3A	76	60	79%
PHYS	4A	82	68	83%
PHYS	4B	32	23	72%
PHYS	4C	37	36	97%

2011 Fall

Subject	Catalog Nbr	Census Enrollment	Retained	Retention Rate
ASTR		**102**	**80**	**78%**
ASTR	10	102	80	78%
CHEM		**443**	**299**	**67%**
CHEM	12A	48	38	79%
CHEM	12B	20	16	80%
CHEM	1A	141	75	53%
CHEM	1B	36	31	86%
CHEM	30A	161	113	70%
CHEM	30B	37	26	70%
PHYS		**287**	**222**	**77%**
PHYS	10	40	34	85%
PHYS	3A	73	51	70%
PHYS	4A	97	77	79%
PHYS	4B	38	29	76%
PHYS	4C	39	31	79%

Chemistry is a difficult subject! The success rates reflect our adherence to high academic standards. Many students try to take chemistry classes without being adequately prepared and with increasing frequency students try to take more than one chemistry classes at the same time (e.g., trying to Chem 12A and Chem 12B, to transfer sooner - probably due to their own time constraints). Some students don’t realize how much work it’s going to be. Our classes are challenging, and we strive to maintain university-level academic standards and our department has earned a reputation of high standards from several local schools. Therefore, many students start the class, but then they realize they’re not doing well or that they don’t have enough time to devote to the class, so they fall behind and drop out. The district-wide Chemistry discipline is addressing this particular issue with the adoption of an entrance exam for

The Chemistry department is emphatically committed to helping students learn. All instructors, full-time and part-time, strive to explain the material as clearly as possible. Students are encouraged to visit instructor's office hours or for those who don't have the time to come visit their instructors to use e-mail. Our Instructors strive to be approachable and supportive and many have worked out many channels of communication. When we hire new part-time instructors, we make an effort to choose instructors that explain the material clearly and care about students and their students' success.

If we were able to restrict enrollment to only well-prepared students, our retention and success rates would increase. However, we are limited in how we can affect this. We can't require prerequisites that other schools don't require. Under-prepared students will continue to enroll in the class, try for a while, and then drop. Making the classes easier is not an option, since students would not be prepared for their subsequent classes or when they continue transfer to a 4-year college or university.

Physics Department Data Analysis

I. Enrollment

	Alameda	Berkeley	Laney	Merritt	District
Census Enrollment F09	28	77	250	81	436
Census Enrollment F10	105	0	268	95	468
Census Enrollment F11	111	39	287	74	511
Sections F09	1	2	5	3	11
Sections F10	3	0	5	3	11
Sections F11	3	1	5	2	11
Total FTES F09	6.53	13.76	56.67	15	91.96
Total FTES F10	20.6	0	60.06	18.55	99.21
Total FTES F11	22.09	5.21	64.84	13.76	105.9
Total FTEF F09	0.43	0.69	2.29	1.12	4.53
Total FTEF F10	1.12	0	2.26	1.12	4.5
Total FTEF F11	1.12	0.27	2.29	0.69	4.37
FTES/FTEF F09	15.3	19.84	24.72	13.39	20.30
FTES/FTEF F10	18.39	0	26.53	16.56	22.05
FTES/FTEF F11	19.72	19.54	28.27	19.84	24.23

II. Student Success					
	Alameda	Berkeley	Laney	Merritt	District
Total Graded F09	26	74	236	83	419
Total Graded F10	94	0	252	83	429
Total Graded F11	104	32	269	68	473
Success F09	16	55	171	45	287
Success F10	62	0	188	65	315
Success F11	63	25	197	47	332
% Success F09	62%	74%	72%	63%	68%
% Success F10	66%	0%	75%	78%	73%
% Success F11	61%	78%	73%	69%	70%
Withdraw F09	6	13	53	14	86
Withdraw F10	25	0	33	12	70
Withdraw F11	32	5	47	11	95
% Withdraw F09	23%	18%	22%	19%	21%
% Withdraw F10	27%	0%	13%	14%	16%
% Withdraw F11	31%	16%	17%	16%	20%

Astronomy Enrollment Data Analysis

I. Enrollment					
	Alameda	Berkeley	Laney	Merritt	District
Census Enrollment F09	151	80	82	51	364
Census Enrollment F10	57	0	48	61	166
Census Enrollment F11	84	53	102	47	286
Sections F09	2	2	2	1	7
Sections F10	1	0	1	1	3
Sections F11	1	1	2	1	5
Total FTES F09	13.91	7	8.49	5.44	34.84
Total FTES F10	5.7	0	4.8	6.1	16.6
Total FTES F11	8.4	5.3	10.2	4.7	28.6
Total FTEF F09	0.4	0.33	0.4	0.2	1.33
Total FTEF F10	0.2	0	0.2	0.2	0.6
Total FTEF F11	0.2	0.2	0.4	0.2	1
FTES/FTEF F09	34.78	21	21.23	27.2	26.20
FTES/FTEF F10	28.5	0	24	30.5	27.67
FTES/FTEF F11	42	26.5	25.5	23.5	28.60

II. Student Success					
	Alameda	Berkeley	Laney	Merritt	District
Total Graded F09	108	70	80	60	318
Total Graded F10	51	0	48	60	159
Total Graded F11	79	49	91	47	266
Success F09	66	56	26	38	186
Success F10	29	0	32	45	106
Success F11	47	32	65	38	182
% Success F09	61%	80%	33%	76%	58%
% Success F10	57%	0%	67%	75%	67%
% Success F11	59%	65%	71%	81%	68%
Withdraw F09	23	6	42	3	74
Withdraw F10	12	0	8	2	22
Withdraw F11	13	9	11	1	34
% Withdraw F09	21%	9%	53%	6%	23%
% Withdraw F10	24%	0%	17%	3%	14%
% Withdraw F11	16%	18%	12%	2%	13%

The persistence rates for Chemistry and Physics shown below are in the top five disciplines at Laney college. Although this rate does not indicate persistence within a discipline, it could reflect an overall trend that science students tend to take more classes.

SUBJECT	F09	S10	F09 to S10 Persistence Rate	F10	S11	F10 to S11 Persistence Rate	F11	S12	F11 to S12 Persistence Rate
LIS	110	89	81%	1	1	100%	41	37	90%
CHEM	541	423	78%	420	356	85%	442	373	84%
JAPAN	164	114	70%	124	82	66%	108	91	84%
PHYS	249	195	78%	268	221	82%	286	240	84%
ECON	349	289	83%	257	218	85%	276	227	82%

b. Identify common challenges to learning among your students? What services are needed for these students to improve their learning? Describe the department's efforts to access these services. What are your department's instructional support needs?

Students need more guidance when determining their class schedule. Often our students lack basic skill sets. Along with learning the copious amounts of information in each of our courses, students must be able to solve problems, write lab reports, manage time, and use a calculator. These are not stated as requirements, but students who are familiar with good study habits do better in our courses. They need a study skills course that would help students with time management, test taking skills, note taking, basic problem solving, how to use a standard scientific (non-graphing) calculator, and writing lab reports. Currently we teach many of these skills as we teach the class, but this occurs too fast for the under prepared student. We have tutoring services available, but many students do not have the time to go or do not realize the importance of study groups and tutoring. Students sometimes need better advice about which Chemistry or Physics class to take. District-wide, the Chemistry departments developed guidelines for students and counselors to use to help choose the right class for their educational goals. This document is attached as Appendix E.

Chemistry students need math background. Typically students enter our classes unprepared to handle the mathematical component of the course, particularly for CHEM 1A/1B. Even though we have a math prerequisite, they still need more math. To this end, the Chemistry department in collaboration with the Math department developed the course *Mathematics for Science Laboratories* (Math 208). This course provides the basic support for the type of math we use in both the lecture and the laboratory.

We need more space for chemistry student to study chemistry. We need a study hall with computers and tutorial programs with which students can use to study and review chemistry and with software for drawing and visualizing chemical structures. We need a place where models and visual aids are available to help students conceptualize the objectives of each course. We need a new science building to house this type of space.

We also need lecture halls large enough so that we can give tests without worrying about cheating, but intimate enough to support learning. Our classrooms are inadequately designed to do demonstrations and are too small to hold the number of students that enroll every semester. In the past our lecture halls have been overcrowded beyond the maximum allowed by the Fire Marshall, however the college recently brought our classrooms and laboratories into compliance with the Fire Marshall standards and have posted the correct room limits in each classroom or laboratory – these are now used to determine enrollment capacities for each class. In doing this our department now “appears” smaller and our effective over all capacity has been reduced. This is excellent for both pedagogy and safety reasons, but highlights our need for more space so that we can serve more students. We need a new science building to accommodate more students, comfortably and safely.

Students need practice and support. They also need more widely available tutoring and study groups. Tutoring used to be available in the library, but not any longer – they have been unable to find chemistry tutors. Demand for tutoring always exceeds the supply. In the past, the Chemistry department had been able to hire tutors, but not for the last two semesters. We would like to hire tutors and expand our free Chemistry tutoring program. We need consistent funding for this vital program.

Students need computer access. Increasingly, students are required to make use of the resources on the Internet to find and decipher chemistry information, especially for laboratory. The department purchased some computers for student use with Measure A funds, however we have a lack of available space to install them for general use. Within the current configuration of our laboratories, space for setting up work areas does not exist. The Chemistry and Physics departments, in conjunction with other science like Biology, need a dedicated computer center for science related computing. This center will be part of the science building that we are requesting.

The campus also has a serious lack of computer IT and hardware support. Laney has one super qualified technician in this area, however it is simply not enough to accommodate all our needs

c. Describe the department's effort to assess student learning at the course level. Describe the efforts to assess student learning at the program level. In which ways has the department used student learning assessment results for improvement?

The Chemistry department has logged all of its effort at assessment at the TaskStream website in accordance with all other district departments and programs. All of these results can be found at TaskStream (www.taskstream.com). The current status for each of our courses is included with this review (as .pdf files).

Assessments of each our our course SLO's is ongoing. For those results that have been reported in TaskStream, where necessary action plans have been developed and suggestions have been made. In cases where the student learning outcomes were achieved, no modification to teach strategies are warranted.

d. Recommendations and priorities.

1. Construct a new science building that would include a "study hall" – space for tutoring and study groups and computers for student use.

2. Reallocate and maintain funding Chemistry and Physics tutors. We need at least $15,000 per academic year.

3. Continue assessing course and program student learning outcomes. Discuss results and use them for improvement.

4. Consult with counselors about maintaining requirements for classes so students do not overload on units while taking chemistry.

5. Offer chemistry academic advising to students during Flex days.

6. Investigate the possibility of a study skills class that would prepare students for the tools used in the courses: calculator, time management, writing lab reports, etc.

*Please either embed or attach data that you will be referencing. Use the Program Review data applicable to your department supplied by your Dean. In addition, the following link, (*http://web.peralta.edu/indev/research-data/documents/ *), will take you to more data that you may find helpful as you study the overall efforts and impact of your unit. See the appropriate tab in attachment C referencing the assessment data.*

6. Human and Physical Resources (including equipment and facilities)

a. Describe your current level of staff, including full-time and part-time faculty, classified staff, and other categories of employment.

The Chemistry department has three full-time tenured instructors and over the last three years has employed 9-11 part-time instructors each semester. Each year our summer program is covered by 5-7 part-time instructors. One of our instructors (Michelle Fossum) is currently serving as the Laney Tenure Review Facilitator, with 0.5 FTE release time. On average, the department teaches course that requires 7 FTEF.

III. Faculty					
	Alameda	**Berkeley**	**Laney**	**Merritt**	**District**
Contract FTEF F09	0.76	0.85	2.3	1.8	5.71
Contract FTEF F10	0.56	0.85	1.94	1.8	5.15
Contract FTEF F11	0.92	0.75	2.91	1.9	6.48
Hourly FTEF F09	2.16	1.64	4.72	1.92	10.44
Hourly FTEF F10	2.2	1.8	4.16	1.08	9.24
Hourly FTEF F11	1.84	1.8	3.44	1.08	8.16
Extra Service FTEF F09	0.16	0.43	0.34	0.28	1.21
Extra Service FTEF F10	0	0.27	0.34	0.64	1.25
Extra Service FTEF F11	0	0.37	0.25	0.54	1.16
Total FTEF F09	3.08	2.92	7.36	4	17.36
Total FTEF F10	2.76	2.92	6.44	3.52	15.64
Total FTEF F11	2.76	2.92	6.6	3.52	15.8
% Contract/Total F09	25%	29%	31%	45%	33%
% Contract/Total F10	20%	29%	30%	51%	33%
% Contract/Total F11	33%	26%	44%	54%	41%

The Physics department has one full-time instructor tenured instructor and employs between 2-3 part-time instructors each term. The department teaches on average 2.3 FTES, which is 2.7 FTES inclusive of Astronomy courses. Each year the summer program is covered by one part-time faculty member.

III. Faculty					
	Alameda	Berkeley	Laney	Merritt	District
Contract FTEF F09	0.43	0	0.7	0	1.13
Contract FTEF F10	1	0	1	0	2
Contract FTEF F11	1	0	1	0	2
Hourly FTEF F09	0	0.69	0.69	1.12	2.5
Hourly FTEF F10	0	0	0.69	1.12	1.81
Hourly FTEF F11	0	0.27	1.01	0.69	1.97
Extra Service FTEF F09	0	0	0.9	0	0.9
Extra Service FTEF F10	0.12	0	0.57	0	0.69
Extra Service FTEF F11	0.12	0	0.28	0	0.4
Total FTEF F09	0.43	0.69	2.29	1.12	4.53
Total FTEF F10	1.12	0	2.27	1.12	4.51
Total FTEF F11	1.12	0.27	2.3	0.69	4.38
% Contract/Total F09	100%	0%	31%	0%	25%
% Contract/Total F10	89%	0%	44%	0%	44%
% Contract/Total F11	89%	0%	44%	0%	46%

Instruction for Astronomy is entirely covered by the faculty who teach Physics. The one Astronomy course taught at Laney accounts for 0.4 FTEF which is part of the teaching load of 2.7 for all Physics faculty.

III. Faculty					
	Alameda	Berkeley	Laney	Merritt	District
Contract FTEF F09	0.2	0	0.2	0	0.4
Contract FTEF F10	0	0	0	0	0
Contract FTEF F11	0	0	0	0	0
Hourly FTEF F09	0.2	0.33	0.2	0.2	0.93
Hourly FTEF F10	0.2	0	0.2	0.2	0.6
Hourly FTEF F11	0.2	0.2	0.4	0.2	1
Extra Service FTEF F09	0	0	0	0	0
Extra Service FTEF F10	0	0	0	0	0
Extra Service FTEF F11	0	0	0	0	0
Total FTEF F09	0.4	0.33	0.4	0.2	1.33
Total FTEF F10	0.2	0	0.2	0.2	0.6
Total FTEF F11	0.2	0.2	0.4	0.2	1
% Contract/Total F09	50%	0%	50%	0%	30%
% Contract/Total F10	0%	0%	0%	0%	0%
% Contract/Total F11	0%	0%	0%	0%	0%

The Chemistry, Physics and Astronomy departments currently have two full-time classified laboratory technicians, one with a 12-month contract and the other with an 11-month contract.

b. Describe your current use of facilities and equipment.

The Chemistry department occupies four laboratory rooms (A235, A236, A237, and A277), four faculty offices (A235A, 236A, A237A, and A276), three equipment storage rooms (part A235B, A235C, and A278), an instrument room (A277A), and two chemical storage areas (part of A235B and A279). The laboratory in A237 is shared with with biology for classes relating to the Biomanufacturing program. The lecture rooms used by Chemistry are A140, A233, A239, A266, A273,nand D200. The laboratory rooms are also used for administering exams , Chemistry tutoring, and faculty office hours when laboratory sessions are not scheduled.

The Chemistry department has a variety of scientific equipment and instruments and an inventory of chemicals and reagents. In the general chemistry laboratories, these include standard glassware, balances, spectrometers, and other sensitive instruments. In the organic laboratory, these include the same as above plus, melting point apparatuses, polarimeters, refractometers, and the following analytical equipment:

Gas chromatographs – one with a mass spectrometer detector (GC, and GC/MS)
Infrared and ultraviolet/visible spectrophotometers (FT-IR and UV/Vis)
Nuclear magnetic resonance spectrometer (NMR)
High pressure liquid chromatograph (HPLC)
Atomic absorption (AA) spectrometer (not currently set up for use)
Rotary evaporator (two are set up, a third is still in the box)

The general chemistry and organic chemistry stockrooms (A235B and A279) house an inventory of various chemical reagents and solutions that are used for all of our laboratory courses.

The Physics department occupies the single laboratory room A274, which also serves as the faculty office, and for lectures utilizes A233, A239, A273, and the Forum. The department has a general storeroom in A272 and an equipment/instrument storage room in A274A.

The laboratory technicians’ office space is in A235A, which is shared with part-time faculty, and also in A272 (Physics general storeroom).

c. Are the human and physical resources, including equipment and location, adequate for all the courses offered by your department (or program)? What are your key staffing and facilities needs for the next three years? Why?

We are requesting two new full-time instructors in Chemistry and one in Physics. Currently, about 30% of our classes are taught by full-time instructors and about 70% are taught by part-time instructors. The additional full-time instructors would reverse that ratio and provide continuity to students and to decrease our dependence on part-time instructors (who could leave at any time). Since all of our courses in Chemistry and most courses in Physics require a laboratory section, greater continuity between the lecture laboratory is achieved when the instructor is one and the same. Additional full-time instructors are needed to share in the many aspects of running the department and participating in shared governance on campus. Although, a select few of our part-time faculty are very involved in assessment and curriculum development, they are not required to be. They are also not required to hold office hours – a few do, but not many. This means less student-teacher contact and therefore a diminished educational experience for the student. In terms of the Chemistry laboratories safety, the ideal is have full-time faculty engaged in the both running the labs and in curriculum development.

Our two laboratory technicians combined have moderate experience in the areas of chemical and safety education and equipment maintenance. The school and the district should (are obliged to) train our staff in the correct use of equipment and chemicals. The staff should be versed in the all of the safety standards and procedures that will enable our stockrooms and laboratories to pass a Cal/OSHA or Fire Marshall inspection. In addition to fire and safety training, which the district already offers, the staff should be undergoing training to stay abreast of current procedures and regulations for chemical teaching laboratories and stockroom management. Neither laboratory technician is educated in these skills.

The current lecture halls, which are shared by many disciplines, are not safe to adequately present chemistry lectures and demonstrations. The laboratory spaces are not suitable for demonstrations since they are poorly designed for lecture type presentations and are simply not large enough to show anything to entire chemistry lecture that has more than 25-30 students, which is most of our sections. This type of classroom could be provided in a new science building (see below). Also, the laboratory rooms are not appropriate for lectures because of their configuration (they are very long rooms, with one chalkboard at one end) and because of the constant noise from the fume hoods.

Over the last three years we have purchased a fair amount of needed equipment through Measure A funds. Much of it has been installed and is being used by students and instructors. This has greatly improved our program, since students can now gain hands-on experience on equipment that they will undoubtedly use again later in their education or in industry. However, there is more equipment to install, which will require some updating of electrical circuits and plumbing. We have run out of space for new equipment, so we have requested a new science building (see below).

The Chemistry and Physics supplies budgets should be maintained at $25,000 and $5000, respectively. In the past both budgets have been a fraction of this amount. We request that our budget be funded at this level and maintained each year.

Our chemical and equipment stockrooms were renovated to meet the need for proper seismic storage of chemicals and equipment and for adequate ventilation, however there are several issues remaining to be fixed. The ventilation of the flammable storage cabinets appears to be ineffective and is likely not safe. We list in the Facilities Needs Table items that should be addressed. We still require a final solution to the state of the floors in the chemical stockrooms (they need a chemical resistant coating), we need 2 dishwashers replaced, and we need at least two more chemical storage cabinets (one of them is to replace a broken cabinet). We have requested these items for the last five (yes, 5) years with no productive results from the college. Additional items listed in Facilities Needs Table that have been requested and have not been address over the last 4 years include installation of an updated supply of compressed air, installation of gas generators used for analytical instruments, and installation of a water purifier unit.

d. If your department experienced a reduction in resources, describe the impact of that reduction on the overall educational quality of your unit and the College.

With the budgetary shortfall over the last three years, the Chemistry department has reduced its course offerings by roughly 20% (25% over the last four years). We are now serving fewer students, while the number of students seeking these classes (the demand) has increased dramatically.

The loss of funds for Chemistry tutors has had a direct impact on the quality of their education. We used to have an ever-expanding vibrant tutoring program offered for free to our Chemistry students and we were ready to expand the program to include Physics students. Funding for tutors has not been available for the last two semesters. Chemistry and Physics tutoring currently relies on student volunteers. While we are fortunate to have a few willing participants, and the tutors gain invaluable experience, the program overall is less reliable without funding. We need an annual tutoring budget of at least $15,000 to pay tutors.

The reduction in workforce regarding services has also had an impact on our students. The cut in staffing of the IMC center has reduced the ability of our faculty to have timely access to copy services. During the last two semesters it has been commonplace to arrive at the IMC window only to find it closed, since there were not enough staff to keep it open. The reduction in custodial staffing has meant that the campus is simply not as clean as it used to be – classrooms and laboratories are not swept regularly and this has had an impact on the quality of the educational experience.

e. How does the department plan to sustain the quality of instruction and/or services offered through your department in the current environment of reduced resources?

The departments of Chemistry, Physics, and Astronomy will continue to offer the quality education that it does currently. We will continue to assess our courses as we have been doing to maintain the high academic standards that we impose on our students. It is the students that we cannot serve when resources are reduced that suffer from the current environment – those students that get a seat in our classes will get the quality education. Those students on the waiting list that do not get in will miss out on educational opportunities.

We continue to advocate for a new science building in order enhance the educational experience of our students. The potential for expansion of the Sciences at Laney is all positive in regard to meeting the demand for quality education in all of the sciences offered at Laney. We feel that the best use of our limited resources is to channel funds in this direction, rather than patching old facilities. On the other hand, we need facilities right now that are safe and effective to teach in until a new science building is complete. So overall, our recommendation is to fix all of the safety and functional issues with our laboratory spaces, enhance the technology capabilities of our lecture halls, and focus on the long term investment in a new science building.

f. What does the department recommend that the college do to maintain quality educational programs and services?

We recommend building a new science building. Hire three new full-time faculty members in Chemistry and Physics. We also recommend maintaining budgets for supplies, part-time faculty, and tutoring. Provide more support in the areas of the IMC copy center and in the custodial staff.

g. Please provide any other recommendations and priorities. (Use the appropriate request forms within Attachment D.)

1. Build a new science building see Appendix F, which details our vision for a new science building.
2. Continue to maintain our current facilities – address the maintenance issues detailed in Appendix D1 and D2

7. Community Outreach and Articulation

For Career and Technical Education Programs:

The Chemistry, Physics and Astronomy departments do not offer CTE programs.

a. Describe the department's connection with industry. Is there an Advisory Board or Advisory Committee for the program? If so, how often does it meet? Is the program adequately preparing students for careers in the field? How are you assessing this?

b. Have students completing the program attained a foundation of technical and career skills? How do you know? What are the completion rates in your program?

N/A

c. What are the employment placement rates? Include a description of job titles and salaries. What is the relationship between completion rates and employment rates?

N/A

d. What are the employment projections (numbers of replacement and new positions) for these job titles over the next 10 years using the California Employment Development Department Labor Market Information? (http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=1004 , and http://www.laney.edu/wp/educational-master-plan/2010-educational-master-plan/ for the Laney College Educational Master Plan, Chapter II, pps. 18-30.)

N/A

e. What industry trends are most critical for the future viability of the program? What are the implications of these trends for curriculum development and improvement?

N/A

***For transfer programs*:**

f. Describe the department's efforts in meeting with and collaborating with local 4-year institutions. How is the program preparing students for upper division course work?

Our departments have not had much direct contact with local four (4)-year institutions. Data was provided by the district about transfer students from 2009-2011 that entered either a UC or CSU program. The data suggest that our students are being generally successful continuing their education, however since there is no direct indication we can only infer that all of the chemically-related fields at these institutes – chemistry, biochemistry, biology, and chemical engineering, biomedical engineering - are getting students that took Chemistry and Physics from us.

Since we teach the traditional topics that all textbooks cover and we strive to make our classes challenging, while at the same time offering a lot of support to our students, we think we are preparing our students well for transfer. However, we have no hard data to support our thesis. Statistical data is needed to support our belief that we are adequately preparing students for transfer. (We would like to see GPAs and science grades for our transfer students.)

Laney college's articulation office has maintained the connections between our courses and the CSU and UC system. All of our courses are transferable to the CSU and UC campuses. With the recent C-ID numbering system (see below) put in place, the connection between our courses and transferability is becoming even more clear to students.

g. Has there been a Transfer Model Curriculum identified for your program? Has it been implemented? If not, what are the plans to do so?

Recently, TMC's were approved for Chemistry and Physics and course identification numbers (C-ID's) have been assigned and aligned with courses at Laney College (www.c-id.net). We are currently in the process of developing transfer degrees (AA-T and AS-T's) for both Chemistry and Physics, in addition to supporting AA and AS degrees currently offer by the school. The transfer degrees will be developed by Spring 2013 along with program-level outcomes.

***For all instructional programs*:**

h. Describe the department's efforts to ensure that the curriculum responds to the needs of the constituencies that it serves.

Our course outlines in Chemistry and Physics are aligned with the standards set by transfer institutions and the allied health professions, especially pre-nursing programs. Our major focus has been on teaching these transfer courses effectively and to ensure that they provide the equivalent educational experience that students would obtain for lower division courses at other institutions. Two recently developed course, *Mathematics for Laboratory Science* (MATH 208), co-developed with the Mathematics department, and *Physics for Building Science* (PHYS 99), developed primarily through the CTE program, address needs that our students have.

If a need is identified, we would be willing to work on developing new courses to fulfill the need, however we have been hesitant to develop new classes, due to the pressure to cancel classes with low enrollments (typical of new courses) and with the current budgetary uncertainties. We are also very busy teaching transfer-level classes that we know will have good enrollments. Without additional full-time Chemistry and Physics instructors, we are not in a position to expand our course offerings very much (part-time instructors have little incentive to develop new courses).

i. Please indicate how many of the full- and part-time faculty have been evaluated in the last three years. For faculty that have not been evaluated in the last three years, what are your plans to become current.

Over the past three years two of our three full-time faculty have been evaluated by peer classroom observations, and all three faculty have had student-teacher evaluations. Approximately 80% of our current part-time faculty have been evaluated by peer classroom observations and student-teacher evaluations. All of our current part-time faculty, except our newest member this semester, are in the Preferred Hiring Pool. One new part-time faculty this Fall 2012 term will be evaluated by both peer observation and student-teacher evaluation by the end of this term. Our goal is to evaluate instructors at least one each academic term.

j. Recommendations and priorities.

1. Maintain our Chemistry and Physics curricula standards to meet the high standards set for transfer programs.

2. Develop the AA-T and AS-T transfer degree programs for Chemistry and Physics.

3. Continue to evaluate our full- and part-time instructors