



Annual Program Review 2011-2012 - INSTRUCTIONAL

Division - Program

PHYSICAL SCIENCES - Chemistry

Authorization

After the document is complete, it must be reviewed and submitted to the Program Review Committee by the Division Chair.

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Overview of the Program

All degrees and certificates are considered programs. In addition, divisions may further delineate and define programs based on their assessment needs (developmental sequences, career track, etc).

Statement of Purpose – briefly describe in 1-3 sentences.

All of the courses taught in the Physical Sciences Division transfer to four-year institutions and apply toward an A.A. or A.S. degree. Some of the courses are general education courses that fulfill a student's physical science requirement and others also serve as foundation courses for students who intend on pursuing professional careers in the sciences (for example, medicine and other health fields, engineering, earth and environmental sciences). As such, the courses "...provide students with the opportunity and support to gain the knowledge and skills necessary to meet their educational, career, and personal goals" and they "...prepare students for their many evolving roles in and responsibilities to our community, our state, and our society."

Please list the **most significant achievement** accomplished since your last program review.

List the current major strengths of your program

1. Prepares students for success in many professions essential to the viability of our culture: medicine, pharmacy, dentistry, computer science, communications, the environment, engineering, medical technology, consumer products, etc.
2. Trains students in critical thinking and problem-solving, expands their powers of observation and their perceptions of connections among diverse physical relationships and their impact upon the world as we experience it daily in addition to future implications.

List the current weaknesses of your program

1. We are unable to serve the larger number of students who need our courses to pursue their educational and professional goals because we can't offer enough course sections and it is difficult to find qualified adjunct instructors for some of our current course offerings.
2. We need more physical facilities, particularly more fume hoods for the organic chemistry laboratories. The Nuclear Magnetic Resonance Spectrometer (NMR) and the Gas Chromatograph need to be repaired for organic analysis classes. Our equipment is aging; repairs are no longer possible for some, and more equipment will need replacing in order to maintain the quality of the program and an appropriate learning experience for the students so that they will be prepared for transfer and/or their professional goals.
3. Mislabeling chemical supplies and other improper stockroom practices can lead to hazardous conditions and accidents in the stockroom, lecture demonstrations, and in student laboratories and create ineffective teaching conditions for faculty.

1.0. Trend Analysis

For each program within the division, use the data provided to indicate trends (e.g., steady, increasing, decreasing, etc.) for each of the following measures.

Program	Academic Year	FTEs Trend	FTEF Trend	WSCH / FTEF Trend	Full-Time % Trend	Fill Rate Trend	Success Rate Trend	Awards Trend
ASTRONOMY	2007-2008	74	4.0	586	40.0%	89.6%	60.7%	0
	2008-2009	63	3.2	630	50.0%	104.2%	64.8%	0
	2009-2010	65	3.2	651	37.5%	100.4%	64.7%	0
	2010-2011	52	3.8	439	57.9%	98.8%	63.4%	0
	% Change	-28.7%	-5.0%	-25.0%	+44.7%	+10.3%	+4.6%	--
	4-Yr. Trend	decreasing	stable	decreasing	increasing	increasing	stable	increasing
CHEMISTRY	2007-2008	472	28.2	534	49.3%	89.5%	68.9%	0
	2008-2009	477	24.9	609	57.4%	107.7%	67.6%	0
	2009-2010	531	26.1	647	51.9%	110.8%	68.5%	0
	2010-2011	453	28.0	515	49.3%	104.3%	67.2%	0
	% Change	-4.0%	-0.6%	-3.4%	-0.0%	+16.5%	-2.5%	--
	4-Yr. Trend	stable	stable	stable	stable	increasing	stable	increasing
GEOLOGY/ Oceanography	2007-2008	176	8.4	668	54.8%	85.8%	70.1%	0
	2008-2009	208	8.0	826	32.5%	102.4%	73.1%	0
	2009-2010	215	8.2	834	39.0%	103.5%	67.4%	0
	2010-2011	196	10.1	618	34.0%	110.5%	69.1%	0
	% Change	+11.4%	+20.2%	-7.4%	-37.9%	+28.9%	-1.4%	--
	4-Yr. Trend	increasing	increasing	stable	decreasing	increasing	stable	increasing
PHYSICAL SCIENCE	2007-2008	22	1.6	439	0.0%	100.0%	72.6%	0
	2008-2009	6	0.4	457	100.0%	104.2%	72.0%	0
	2009-2010	0	0.0	--	--	--	--	0
	2010-2011	0	0.0	--	--	--	--	0
	% Change	-100.0%	-100.0%	--	--	--	--	--
	4-Yr. Trend	decreasing	decreasing	increasing	increasing	increasing	increasing	increasing
PHYSICS	2007-2008	89	5.8	488	86.2%	70.7%	72.3%	0
	2008-2009	95	5.6	541	85.7%	78.4%	68.7%	2
	2009-2010	111	5.4	653	55.6%	92.2%	73.9%	0
	2010-2011	109	7.3	473	55.4%	93.1%	70.4%	1
	% Change	+22.4%	+26.4%	-3.2%	-35.7%	+31.6%	-2.6%	--
	4-Yr. Trend	increasing	increasing	stable	decreasing	increasing	stable	increasing
PHYSICAL SCIENCES DIVISION TOTAL	2007-2008	833	48.0	553	52.3%	86.2%	68.5%	0
	2008-2009	849	42.1	641	56.3%	101.3%	69.6%	2
	2009-2010	922	42.9	684	48.8%	104.3%	68.2%	0
	2010-2011	811	49.2	524	47.7%	103.7%	68.0%	1
	% Change	-2.7%	+2.6%	-5.2%	-8.7%	+20.3%	-0.8%	--
	4-Yr. Trend	stable	stable	stable	stable	increasing	stable	increasing

1.1. Describe how these trends have affected student achievement and student learning:

Although most of the trends are stable (except the fill rate which is increasing), our success rate has gone down a little we think because of the loss of 2 full time faculty whose positions have not been refilled. They have been replaced by adjuncts, and there has been a high turnover of adjuncts in large important courses like Chemistry 101. Students have been complaining loudly about some of these adjuncts. Other departments (Biology) have noticed a drop in the quality of students completing these courses.

1.2. Is there other relevant quantitative/qualitative information that affects the evaluation of your program?

Although the Chemistry numbers across all the columns in the table show decreases from 2009 to 2010, this is not because the students are not available. In fact the faculty typically have large numbers of students pleading to be added to their classes, and Wait-Lists are long.(typically 25 or more) The decrease was caused by the budget and the need for section offerings to be reduced.

2.0. Student Learning and Curriculum

Provide the following information on each department and program within the division.

List each Department within the Division as well each degree, certificate, or other program* within the Department	Active Courses with Identified SLOs		Active Courses Assessed		Course Sections Assessed		If this area has program outcomes have they been assessed? Yes or No
	n/n	%	n/n	%	n/n	%	
CHEMISTRY	7/7	100%	4/7	57%	1/3	33%	N/A

2.1. Please comment on the percentages above.

Chemistry has written all of its SLO's and assessed the majority of its courses. That remaining un-assessed courses will be assessed in the next two years.

- 2.2. a) Please provide a **link*** to all program assessment timelines here. This link could be to your division /department website, eLumen, etc.
 b) Briefly summarize any pedagogical or curricular elements of courses/programs that have been changed or will be changed as a result of developing assessment timelines and course/program alignment matrixes.
 c) Based on the program assessment timelines you have developed and the evidence you have gathered, please comment briefly on how far along your division/program is in the assessment process.

- a, <http://vision.glendale.edu/index.aspx?page=245>
 b. Based on assessments of Chemistry 110 where only 64 to 83% of students were achieving the SLO's, a lab manual was written to give the student more practice in problem solving techniques that will help them to improve their success in achieving their slo's.
 c. Within the next two years ,all of our courses will be assessed or reassessed.

- 2.3 a) Please provide a **link** to any program and/or relevant course assessment reports. Does the evidence from assessment reports show that students are achieving the desired learning outcomes?
 b) Please briefly summarize any pedagogical or curricular elements of courses and/or programs that have been changed or will be changed as a result of the assessments conducted.

a, <http://vision.glendale.edu/index.aspx?page=245>

b. Based on assessments of Chemistry 110 where only 64 to 83% of students were achieving the SLO's, a lab manual was written to give the student more practice in problem solving techniques that will help them to improve their success in achieving their slo's. Within the next two years ,all of our courses will be assessed or reassessed.

- 2.4 Please list all courses which have been reviewed in the last academic year.
Note: Curriculum Review is required by the Chancellors Office every 6 years.

None

- 2.5 Please list all degree/certificate programs within the division that were reviewed in the last academic year.

The only degree./certificate program in the division is the Physical sciences AA . The PSLO for that has just been updated but the program has not been reviewed.

- 2.6 For each program that was reviewed, please list any changes that were made.

N/A

3.0. Reflection and Action Plans

- 3.1 What recent activities, dialogues, discussions, etc. have occurred to promote student learning or improved program/division processes?

A Division Retreat is planned for the Intersession.

The Organic Winter Student research program challenges students to problem-solve on a higher level than in the classroom and provides students with the opportunity to experience research conditions, a preview and good preparation for transfer and advanced-level courses. These students have participated in two state-wide chemistry conferences.

Faculty are engaged in a program to present in Division meetings surveys, studies, or other issues related to teaching. A recent presentation raised relevant questions for testing rubrics and student assessment.

Institute Day SLO workshops.

3.2 Using the weaknesses, trends and assessment outcomes listed on the previous pages as a basis for your comments, please briefly describe your plans and/or modifications for program/division improvements

Plans or Modifications	Anticipated Improvements
The department plans to write lab manuals for Chemistry 101, Chemistry 121, Chemistry 105, and Chemistry 106.	This would significantly lower the cost of lab manuals for students. The material would also be tailored to the pedagogical goals of our classes and lab equipment. Experiments can be modified so smaller-scale quantities, decreasing the amount of chemicals used, the chemical waste to be disposed of, and decrease costs for the department and the college.
Remodel SB 243: reconfigure the room so that faculty can use the chalkboard and computer or online teaching aids at the same time.	This would allow the use of visual images simultaneously with written equations or other information that mutually enhance the learning experience for students.

Format Rev. 9.29.11

2011 PROGRAM REVIEW

**PHYSICAL SCIENCES-
CHEMISTRY**
FT Chemistry Instructor

I:PS.Ch-1

Section 4
IHAC Request

If this is a repeat request, please list the Resource ID code or year requested: __2011__

4.1 The Office of Instruction will provide data on instructional hires during the past five years, including the full-time percentage of each new hire.

a) Number of full-time faculty currently assigned to the Program	5.6*
b) Number of full-time faculty assigned to the Program in 2005	7
c) Does this position cover classes currently taught by adjuncts? Yes or No	Yes
d) Does this position contribute to program expansion? Yes or No	No

*For this year temporarily there are 6 because Bob Gellert (a 60% permanent employee) was granted a one year temporary 100% contract position. In June Bob will revert back to a 60 % contract.

4.2 CPF Index (Committees Per Full-time Faculty)

1. Total number of full-time faculty members in this department/program.	5.6*
2. Total number of committees in which all FT faculty members in this area participate (Governance and other campus related committees & participation).	5
3. CPF INDEX (Total of # 2 divided by #1)	.88

4.3 Status of Released Time Faculty

Faculty Name	Release Time Position	% RT	Term of Assignment
No chemistry faculty currently have release time.			

4.4 How does this assignment relate to the college's Mission Statement?

The chemistry program prepares students for careers ranging from medicine to engineering and exposes students to the rich scientific culture on which modern society is based.

4.5 How does this position relate to the objectives and functions of the college?

- | | |
|--|------------------------------|
| a) Associate Degree | d) Basic Skills development |
| b) Transfer to a four-year institution | e) Noncredit Adult Education |
| c) Career and Technical Education | f) Personal enrichment |

Associate Degree, Transfer to a four-year institution, Career and Technical Education, and Personal enrichment.

- 4.6** Describe how this position enhances student success. Ex: enhances instructional skills, meets community or industry needs. Contributes to state of the art technical education, etc. What measureable outcome will result from filling this request?

There is tremendous demand in this community for chemistry, which this college needs to meet, because students see chemistry as a key to their success in pursuing careers in health, engineering, and other science professions, There is also a very large nationwide and regional demand to fill such positions.

- 4.7** Are there anticipated negative impacts for not hiring this position? If so describe.

The key negative impact is loss of instructional quality as control over curriculum and instruction is lost to adjunct faculty who have no vested interest in the program as a whole. Loss of instructional quality in the chemistry sequence of courses produces students with less potential for success in subsequent chemistry courses as well as the other science courses, such as biology, for which chemistry is a prerequisite both at GCC and transfer institutions.

Because we are a small department, it is sometimes difficult to fill positions for hiring committees and take care of other professional responsibilities for the department and the college.

The number of students on the Wait-Lists increases each semester.

GCC loses many of the wait-listed students who are unable to enroll in our chemistry classes and who then often go elsewhere to other educational institutions.

- 4.8** Are there any other special concerns not previously identified? If so, please explain.

a) The biology division has contacted the chemistry department regarding academic standards. Their perception is that students' chemistry preparation for Biology 101 has declined in the last few years, coincident with loss of full-time faculty in chemistry.

b) The number of students wait-listed for "feeder" chemistry courses has increased drastically over the past few years with numbers of wait-listed students totaling the equivalent of several sections.

c) Committee assignments among chemistry faculty may be lower than other divisions due to the number afternoon chemistry labs that full-time faculty are needed to teach and which conflict with many scheduled committee meetings.

APPROVALS

AGENCY	DECISION						
The Program Review Committee has reviewed the data, outcomes and plans in the report and finds this request to be: NA	Well supported						
	Adequately supported						
	Not supported						
	Reason:	Sect.1: Data		Sect.2: SLOs		Sect.3: Plans	Other:
Standing Committee Review of Resource Request Committee: Academic Affairs						Prioritization Score	

2011 PROGRAM REVIEW**Section 4
Resource Request****PHYSICAL SCIENCES -
CHEMISTRY
Lab Equipment****I:Ps.Ch-2**

Type of Request: ☐ Facilities/Maintenance ☐ Classroom Upgrades ☐ New space
☒ Instructional Equip. ☒ Non-Instructional Equip ☐ Conference/Travel ☐ Training
☐ Computer/Hardware ☐ Software/Licenses ☐ Supplies ☐ Other

Mandatory: Is this request for one-time funding? ☐ OR Does this request require ongoing funding? ☐

If this is a repeat request, please list the Resource ID code or year requested: _____

Mark if the following apply to this request: ☐ Health & Safety Issue ☐ Legal Mandate
☐ Accreditation Requirement ☐ Contractual Requirement

NOTE: I don't know how to write each request on a separate page since this program will not allow me to copy and paste additional pages. Sorry.

4.1. Clearly describe the resource request.

<i>Item #</i>	<i>Type of Request</i>	<i>Resource Request</i>	<i>Amount Requested</i>
1	Non-Instructional Equipment	Justrite Corrosive liquids storage cabinet; 22" H X 17" W X 17" D; meets Cal/OSHA and NFPA codes	1 @ \$421.00 = \$421.00
2	Non-Instructional Equipment	Justrite Flammable liquids storage cabinet; 65H X 34W X 34D; meets Cal/OSHA and NFPA codes	1 @ \$898.00 = \$898.00
3	Instructional Equipment	Corning digital hot plates 5 x 7 inch Pyrocera top, # 6795-400D	6 @ \$263.25 = \$1579.50
4	Non-Instructional Equipment	Stainless steel lab carts with guard rails; 300 lb capacity, #AP5432	2 @ \$363.40 = \$726.80
5	Instructional Equipment	Chargers for Mac laptops programmed for use in the laboratory	4 @ \$100.00 = \$400.00
6	Instructional Equipment	Unit VSEPR Theory Large Models; # 69175V	2 @ \$279.00 = \$558.00
		Total	\$4,583.30

4.2. Justification and Rationale: What planning goal, core competency or course/program SLO does this request address? Use data from your report to support your request.

<i>Item #</i>	<i>Resource Request</i>	<i>Goal</i>
1	Justrite Corrosive liquids storage cabinet	Maintain a safe storage environment for corrosive chemicals. The current storage cabinet is many years old and is becoming corroded itself. The department requested a replacement cabinet last year, but it was not funded at that time. NOTE: the department has gradually been changing experiments to decrease the amount of chemicals needed (decreasing costs of chemical supplies and waste disposal for the department and the college). The requested cabinet is also a smaller size and less costly than a replacement for the currently existing cabinet would be.
2	Justrite Flammable liquids storage cabinet	Maintain a safe storage environment for flammable chemicals. The department has been buying more chemical in bulk quantities in order to obtain lower price rates (thus decreasing costs of chemical supplies and waste disposal for the department and the college). But our current flammables cabinets are full. Sometimes a few chemicals have had to be temporarily stored on the floor in the chemical stockroom, which is a bit precarious. In order to continue ordering in bulk, and extend this practice to other chemicals, the department needs another safe flammable storage cabinet. The cost of another cabinet will be offset by savings to the department and the college as chemicals are purchased at a lower price.
3	Corning digital hot plates	Hot plates are shared by students among the labs of various courses. In order to have enough hot plates for each pair of students in a 32-student section, the department needs 6 more hot plates. This is necessary for students to be able to perform their experiments. Our equipment is getting old and is sometimes not repairable.
4	Stainless steel lab carts with guard rails	Two carts are needed to replace carts that can no longer be wheeled from one location to another. Stockroom technicians depend on being able to place the chemicals and equipment for each experiment onto a cart and wheel it into the appropriate lab. With two carts non-wheelable, and a limited number of carts for all the labs, they have resorted to preparing a set of chemicals in the stockroom on a defective cart in advance of the lab meeting and then transferring them by hand to the laboratory. This is a waste of the technicians' time when they need to be taking care of other laboratory responsibilities.
5	Chargers for Mac laptops	Again, an issue of not having enough equipment for students to use in order to complete their lab assignments.
6	Unit VSEPR Theory Large Models	Two demonstration-size model sets are needed so that faculty will have enough pieces to make and show students models of several different shapes at the same time. This is needed for students to be able to compare three-dimensional shapes and to see how different molecules can come together to form a different substance in a chemical reaction.

4.3. What measurable outcome will result from filling this resource request?

<i>Item #</i>	<i>Resource Request</i>	<i>Outcome</i>
1	Justrite Corrosive liquids storage cabinet	Safe chemical storage.
2	Justrite Flammable liquids storage cabinet	Safe chemical storage. This would also support the department in being able to purchase bulk chemicals, thereby decreasing expenses for the college and the department—as previously noted.
3	Corning digital hot plates	Students will be able to perform their experiments safely. Without enough equipment, students tend to crowd each other; if they have to wait in turn for equipment, they sometimes do not have enough time to complete their experiment. Having adequate equipment should enhance the learning environment and help ensure a healthy pedagogical atmosphere.
4	Stainless steel lab carts with guard rails	The stockroom technicians have actually requested four lab carts because of the number of lab sections that need to be supplied for experiments daily, as well as the carts that instructors need for demonstrations in lecture. Because of the expense and budget constraints, the request was reduced to two carts to replace the two non-wheelable carts. (Is it still a cart without wheels?)
5	Chargers for Mac laptops	Chargers are needed to provide an adequate learning experience for students as they are analyzing their experimental data, and sometimes graphing it. Sometimes computers are also used to monitor experiments and acquire data.
6	Unit VSEPR Theory Large Models	Visually enhance the learning experience for students. Demonstrate how different substances interact with each other in physical processes such as dissolving, and how they interact rearrange their parts in chemical reactions.

APPROVALS

AGENCY		DECISION						
The Program Review Committee has reviewed the data, outcomes and plans in the report and finds this request to be:	Well supported							
	Adequately supported						X	
	Not supported							
	Reason:	Sect.1: Data		Sect.2: SLOs		Sect.3: Plans	Other:	
Standing Committee Review of Resource Request								
Committee: Academic Affairs						Prioritization Score		