Annual Program Review Update

Instructions
The Annual Update is conducted district-wide by each program/discipline and consists of a) analysis of general changes, staffing, resources, facilities, equipment and other needs, as well as b) reporting of curricular changes and outcomes assessment.

The questions on the subsequent pages are intended to assist you in planning for your program or area. **Input should be sought from all campuses.** It should be **submitted or renewed every year by the designated date** in anticipation of budget planning for the next fiscal year.

Institutional data used to document program/discipline statistics and trends will be provided by Institutional Research.

Please include pertinent documents such as student learning outcomes assessment reports and data analysis to support any requests for new faculty, facilities, equipment, etc. Retain this information for your discipline’s use,

Submit an electronic copy of your Annual Update Document and supporting data to the Program Review Committee. Also submit a copy of these documents to your Division Chair, Director, or Campus Lead Faculty.
Annual Program Review Update
*Be sure to include information from all three campuses.

Program/Discipline: Chem/Physc
Submitted by (names): Sartori and Farnham
Contact Information (phone and email): x4231 tony-sartori@redwoods.edu
Date: 09/22/08

1. Program/Discipline Changes
Has there been any change in the status of your program or area since your last Annual Update? (Have you shifted departments? Have new degrees or certificates been created by your program? Have activities in other programs impacted your area or program? For example, a new nursing program could cause greater demand for life-science courses.)

Note: curricular changes should be addressed under 12 (Curriculum).

☐ No (go to next question)
☒ Yes  Describe the changes below:

New approved Liberal Arts Degree with seven emphases. The Science Exploration emphasis included chemistry and physical science courses as electives. The Science emphasis requires chemistry as a core component. The last Program review also mentioned the Science Transfer Prep Program, which is not a degree program but rather an advising tool. The number of students advised into chemistry through this program is unknown.

2. Program/Discipline Trends
Refer to the data provided (data link is located at http://inside.redwoods.edu/Assessment/ProgRev/InstructionalProgramReviewData.asp) and describe the trends in enrollment, retention, success rates, and student demographics. If applicable, describe how changes in these areas are impacting your discipline and describe efforts within your area to address these impacts.

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrollment</th>
<th>Retention% (avg)</th>
<th>Success% (avg)</th>
<th>Demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004-05</td>
<td>295</td>
<td>67-100 (77)</td>
<td>45-100 (57)</td>
<td></td>
</tr>
<tr>
<td>2005-06</td>
<td>259</td>
<td>70-89 (77)</td>
<td>40-89 (58)</td>
<td></td>
</tr>
<tr>
<td>2006-07</td>
<td>129</td>
<td>71-89 (78)</td>
<td>53-89 (61)</td>
<td></td>
</tr>
<tr>
<td>2007-08</td>
<td>213</td>
<td>73-89 (83)</td>
<td>43-73 (60)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physc 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-05</td>
</tr>
<tr>
<td>2005-06</td>
</tr>
<tr>
<td>2006-07</td>
</tr>
<tr>
<td>2007-08</td>
</tr>
</tbody>
</table>
The enrollment trend shows a dramatic decrease from 2005-06 to the following year and a dramatic increase the next year. The decrease coincides with the cutting of sections that was the trend at the time and the appointment of a chemistry FTE as an 80% reassigned time division chair. The following year's increase was due to the reverse trend of trying increase FTES although the faculty member was still the division chair.

The retention rates for chem are similar to those in Oceanography but are less than most other disciplines in MSE by 10%. All chemistry classes require prerequisites and are preparatory in nature. This may explain the lower retention rates along with difficulties in advising students.

The success rates are constant. Comparing only the 2007-08 year, it is noteworthy that the success rates in Astro, Chem, For, Meteo, and Ocean are all at 58% (Astro) or 60%. The lowest rate is in Math (55%) and the highest are Biol (73%), Geol (75%), and Phys (80%) although it is unknown what all of this means.

I would suggest that the constant retention rates and success rates indicate that the reasons for each are also fairly constant. This might mean it could be easier to isolate the reasons and attempt an approach to increase rates while maintaining the preparatory nature of the courses. Or it might indicate that there are reasons that are beyond remedy (or not requiring remedy) and should be accepted. At any rate, there is a fairly constant baseline for success and for retention.

3. **Labor Market Review (for occupational programs)**
   Occupational programs must review their labor market data. Links to various reports and information, as well as instructions on how to create program-specific reports, can be found at [http://www.redwoods.edu/District/IR/Reports/LaborMarket.asp](http://www.redwoods.edu/District/IR/Reports/LaborMarket.asp). Institutional Research (IR) is available to help with surveys and reviews. All survey data (whether collected by your program or the institution) should be sent to IR to be kept on record.
   - Meets a documented labor market demand,
   - Does not represent duplication of other training programs (in the region), and
   - Is of demonstrated effectiveness as measured by the employment and completion success of its students.

   N/A

4. **Budget Resources**
   List your area’s budget for the following categories in the table below. Restricted funds have a sponsor/grantor/donor (federal, state, local government, etc). The
funds are restricted by the sponsor/grantor/donor. Everything else is unrestricted.

<table>
<thead>
<tr>
<th>Category</th>
<th>Unrestricted Funds</th>
<th>Restricted Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply and printing budget</td>
<td>$200.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Equipment replacement and repair budget</td>
<td>$5225.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Professional Development</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Work-study funding</td>
<td>$0.00</td>
<td>$3500.00</td>
</tr>
<tr>
<td>Additional Budget Items</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

Is the funding for these areas adequate? ☐ Yes ☒ No
If not, describe the impact of unaddressed needs on your discipline or program.

The costs of chemicals and glassware increases each year but the chemistry budget does not. We have taken measures to reduce costs by having students work in pairs or groups of four and by microscaling most experiments. We also do not have a regular work-study budget for stockroom help. It changes from year-to-year.

5. Learning Resource Center Resources

Is the level of resources provided by the Academic Support Center and Library (Learning Resource Center) adequate. ☐ Yes ☒ No
If not, explain.

While there are math tutors in the ASC in addition to the math lab, there are no science tutors. This is problematic for chemistry courses. The ASC should provide chemistry tutors. Most chemistry tutors will also be able to perform as math tutors and often as biology tutors.

6. Student Services Resources

Complete the following grid concerning Student Services Areas.

<table>
<thead>
<tr>
<th>Student Services Area</th>
<th>Does the area satisfy the needs of your discipline?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There is a connection to this discipline/program and YES the student services area does satisfy the needs of the discipline.</td>
</tr>
<tr>
<td></td>
<td>There is a connection to this discipline/program and NO the student services area does not satisfy the needs of the discipline.</td>
</tr>
<tr>
<td></td>
<td>Uncertain about the student service area provided or how it connects to this discipline/program</td>
</tr>
</tbody>
</table>

Admissions and Records
Counseling
Financial Aid
Career Services
Disabled Student Programs

☒ ☐ ☐ ☐ ☐ ☐ ☐ ☒ ☒ ☒ ☒ ☒
If a lack of support was indicated in the table above, describe your program/discipline need.
We are not sure how students are counseled when entering programs. Many students would benefit from a chemistry course when considering their physical science electives for their program or degree. For instance, nursing students and forestry students would benefit from taking chemistry early in their programs. This is also the case for biology students. While other physical science courses incorporate some of the fundamentals of chemistry, such as atomic structure, students would benefit from a broader and more in depth introduction to chemistry.

7. Faculty Resource Needs
Complete the Faculty Employment Grids below (data link is provided at http://www.redwoods.edu/District/IR/Reports/EnrollmentFTES.asp).

<table>
<thead>
<tr>
<th>Discipline Name (e.g., Math, English, Accounting)</th>
<th>Total Teaching Load for fall 2007 term</th>
<th>% of Total Teaching Load by Full-Time Faculty</th>
<th>% of Total Teaching Load Taught by Part-Time Faculty</th>
<th>% Change from fall 2006</th>
<th>% Change from fall 2005</th>
<th>Explanations and Additional Information (e.g., retirement, reassignment, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem/Physc</td>
<td>31.5</td>
<td>62</td>
<td>38</td>
<td>0</td>
<td>-10.18</td>
<td>One FTE was division chair F2006-S2008; nursing accepted a nonarticulated chem course as prereq and finally removed chem prereq from catalog; One FTE had</td>
</tr>
</tbody>
</table>
Faculty Load Distribution in the Program

<table>
<thead>
<tr>
<th>Discipline Name (e.g., Math, English, Accounting)</th>
<th>Total Teaching Load for spring 2008 term</th>
<th>% of Total Teaching Load by Full-Time Faculty</th>
<th>% of Total Teaching Load Taught by Part-Time Faculty</th>
<th>% Change from spring 2007</th>
<th>% Change from spring 2006</th>
<th>Explanations and Additional Information (e.g., retirement, reassignment, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem/Physc</td>
<td>43.5</td>
<td>76</td>
<td>24</td>
<td>+7.5 TLU</td>
<td>-4.5 TLU</td>
<td>DN campus taught a Chem 2 in S2006 but no longer has a min qualified faculty member to teach chem; one FTE had 6 TLU reassign time for Senate co-president in S2008; See comments for fall semesters for additional comments</td>
</tr>
</tbody>
</table>

a. Describe the status of any approved, but unfilled full-time positions.
N/A

b. If you are requesting a Full-Time Faculty position develop an attachment to this report that addresses the following criteria (as listed in AR 305.03)
   • The ratio of full-time to associate faculty
   • Current availability of associate faculty
   • Relation to program review recommendations
   • Effect on diversity of the faculty
   • Effect on academic offerings and ability to serve students and the community
   • Effect on the vitality and future direction of a program and/or the college
- Effect on student learning

c. If your Associate Faculty needs are not being met, describe your efforts to recruit Associate faculty and/or describe barriers or limitations that prevent retaining or recruiting Associate Faculty. **Currently, there are no associate faculty needs.**

8. Staff Resources
Complete the Classified Staff Employment Grid below (please list full- and part-time staff). This does not include faculty, managers, or administration positions. If a staff position is shared with other areas/disciplines, estimate the fraction of their workload dedicated to your area.

<table>
<thead>
<tr>
<th>Assignment (e.g., Math, English)</th>
<th>Full-time (classified) staff (give number)</th>
<th>Part-time staff (give number)</th>
<th>Gains over Prior Year</th>
<th>Losses over Prior Year (give reason: retirement, reassignment, health, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Science</td>
<td>0.5 (0.5 physical science, 0.5 life science) majority of assign time in PS is chemistry</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Do you need more full-time of part-time classified staff? □ yes □ no
If yes, explain why.
N/A

9. Facilities, and Classroom Technology
Are teaching facilities adequate for achieving the educational outcomes of this discipline/program? □ Yes □ No

If No was checked, complete and attach Facility Form (facilities.form) for each instructional space that does not meet the needs of this discipline/program:

10. Equipment
Is the available equipment (other than classroom specific equipment described in the facilities section) adequate to achieve the educational outcomes of your program/discipline? □ Yes □ No

If No was checked, complete the following grid for each piece of equipment being requested for this area/discipline:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Approximate Price</th>
<th>Number of students using equipment each semester</th>
<th>Describe how the equipment allows achievement of program/discipline educational outcomes</th>
</tr>
</thead>
</table>
Equipment Repair
Is the equipment used for your discipline/program in need of repair, which is outside your current budget allotment? This does not include classroom specific equipment repair described in the facilities section. ☒ Yes ☐ No

If Yes was checked, provide the following information to justify a budget allotment request:

<table>
<thead>
<tr>
<th>Equipment requiring repair</th>
<th>Repair Cost / Annual maintenance cost</th>
<th>Number of students using equipment each semester</th>
<th>Describe how the equipment allows achievement of program/discipline educational outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable laptop</td>
<td>replacement at $1000</td>
<td>approximately 100</td>
<td>Allows use of streaming media, Power Point presentations, internet access</td>
</tr>
</tbody>
</table>

11. Learning Outcomes Assessment Update.

List all expected program-level outcomes, whether you have completed the assessment loop (use of results) or not. For each outcome, identify the means of assessment and the criteria for success. Summarize the data that have been collected in the ‘Assessment Results’ column. If no data have been collected and analyzed for a particular outcome, use the ‘Assessment Results’ column to clarify when these data will be collected and analyzed. In the fourth column, indicate how the assessment results are being used to improve the program.

<table>
<thead>
<tr>
<th>Program Outcomes (Not all disciplines have program-level outcomes)</th>
<th>Means of Assessment and Performance Criteria</th>
<th>Assessment Results Summary</th>
<th>Use of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List all course-level student learning outcomes for which some assessment activity (assessment, analysis, or use of results) has taken place since the most recent program review, and complete the table below as appropriate

<table>
<thead>
<tr>
<th>Student Learning Outcomes (course-level)</th>
<th>Means of Assessment and Performance Criteria</th>
<th>Assessment Results Summary</th>
<th>Use of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 1A</td>
<td>Final exam question</td>
<td>Not yet completed</td>
<td></td>
</tr>
<tr>
<td>Chem 2</td>
<td>Final exam</td>
<td>Not yet completed</td>
<td></td>
</tr>
</tbody>
</table>
Discuss the extent to which part-time faculty (if applicable) have been involved in the dialogue about assessing student learning outcomes:

There is an intern at the Mendocino campus who is teaching Chem 2. He is included in the decision for assessment for that course. Chem 1A and Chem 100 have only one instructor for each who are responsible for choosing an SLO to assess for each course.

12. Curriculum Update

Identify curricular revisions and innovations undertaken
a. in the last year.
   Updated Chem 100, 1A, 1B, 2, 3, and 8.
   b. planned for the coming year.
   Submit Chem 10-Chemistry Exploration and inactivate or revise Chem 152.

Complete the grid below. The course outline status report can be located at: http://www.redwoods.edu/District/IR/Reports/Curriculum/Curriculum_Course_Outlines.htm

<table>
<thead>
<tr>
<th>Course</th>
<th>Year Course Outline Last Updated</th>
<th>Year Next Update Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 100</td>
<td>2008</td>
<td>2013</td>
</tr>
<tr>
<td>Chem 2</td>
<td>2008</td>
<td>2013</td>
</tr>
<tr>
<td>Chem 3</td>
<td>2008</td>
<td>2013</td>
</tr>
<tr>
<td>Chem 1A</td>
<td>2008</td>
<td>2013</td>
</tr>
<tr>
<td>Chem 2A</td>
<td>2008</td>
<td>2013</td>
</tr>
<tr>
<td>Chem 8</td>
<td>2008</td>
<td>2013</td>
</tr>
<tr>
<td>Chem 40</td>
<td>2008</td>
<td>N/A</td>
</tr>
<tr>
<td>Chem 152</td>
<td>2001</td>
<td>2008</td>
</tr>
</tbody>
</table>

If the proposed course outlines updates from last year’s annual update (or comprehensive review) were not completed, please explain why.
Chem 152 slipped through the cracks in Spring 2008. Due to the lack of tutors, it may have to be updated to allow students access to tutoring for chemistry.

13. Communication

Are the current lines of administrative, faculty, and staff communication adequate to meet the needs of this discipline/program? Describe representative example of effective or ineffective communication.
Communication has improved over the last two years with having a faculty division chair. Communication with an administrative chair was not as fluid.
(instructional to administration). Communication with the sciences is also becoming better due to the faculty division chair structure.

Communication within the physical sciences should be re-examined and may need to evolve. For instance, there is the need to add chemistry courses to the schedule to provide FTES for the district and TLU for the two FTE chemistry professors. The area of growth is in GE courses but scheduling for most GE courses for nonscience majors is done by Earth Sciences/Astro-Phys. This has been appropriate for past practices but may have to be reconsidered if we wish to grow in chemistry FTES and TLU. This may not be required if online chemistry courses are developed. Currently, there is only one online course offered in the physical sciences—a hybrid Chem 2 course. This is an area that should be explored if faculty are given the time and resources to develop quality online instruction.

List any action plans submitted since your last annual update. Describe the status of the plans. If they were approved, describe how they have improved your area.
None.

15. Goals and Plans
If you have recently undergone a comprehensive review, attach your Quality Improvement Plan (QIP) if applicable.

☐ QIP Attached
If you do not have a QIP, refer to the goals and plans from your previous annual update. For each goal and/or plan, comment on the current status. List any new goals and plans your area has for the coming year, and indicate how they are aligned with the goals/objectives in CR’s Strategic Plan. (CR’s strategic plan is located on the web at http://inside.redwoods.edu/StrategicPlanning/strategicplan.asp).

Recommendations from Program Review Summary 2007-08:
Area Recommendations:
• Continue to work on advising to help with declining enrollments due to Health Occupation program changes, and with declines in Science Major preparation courses.
• Investigate and evaluate the need for a more general Health Occupations chemistry course and the need and potential for online instruction.

District Recommendations:
• Establish open planning and communication process regarding facilities
• Develop systematic planning to address capitol equipment purchase, repair and replacement. A similar process should exist for budgeting supplies and staff.

Current status:
1. Declining enrollments in chemistry course for health occupation programs is being addressed by starting a dialog with biology faculty concerning chemistry prerequisites for microbiology and physiology. Of eight other community colleges in California examined, all that offer microbiology require a chemistry
prereq and six of seven require a chemistry prerequisite for physiology. Biology instructors seem to overwhelmingly support a chemistry prerequisite for these courses. If a chemistry prerequisite is to be added to these courses, it must be phased in so that students can still apply for the nursing program. We might also have to find a way to offer chemistry at DN. DN does not currently have a qualified chemistry instructor and could benefit from distance education. The STPP, Science Transfer Prep Program may advise more students into chemistry courses required for major prep and this may also increase enrollments.

2. Online instruction is being considered for Phyc 10 but has not been implemented. Other courses being considered are Chem 100 and a proposed Chem 10. There was an attempt to address the lack of a Preparation for General Chemistry at HSU by offering a night course of CR's Chem 100 in F2008. The class was canceled due to low enrollment of only eight students. A 2009S class is being discussed with the Chemistry/Physics chair at HSU.

3. In the last program review the chemistry program review did not look at the review as an opportunity to address all facilities problems. Measures are being taken to address these issues for this program review.

4. The chemistry budget is not large enough to provide for systematic budgeting of larger ticket items (as is the case for other departments). Action plans will be submitted for equipment purchases such as computers, projectors, and a document camera until the district allocates adequate funding for all instructional spaces.
Facilities, and Classroom Technology Form
Program/Disciplines:  Chem/Physc
Year:  2008-09
Submitted by:  Sartori

List classroom or instructional space name/number:  **PS 104**

Check if any of the following are not adequate:

- [ ] Ventilation / room temp
- [x] ADA access
- [ ] Number of seats / work stations
- [x] Technology (computers, projectors, internet)
- [x] Other (briefly describe):

  **Not enough room between stations for students to work safely.**

Describe the specific action and estimated cost (if available) to make this space adequate for your instructional needs:

Suggest that we do not update with computer and projectors since the room is not usually used by CR classes. Safety issue should be rectified with a new academic building. However, ADA and safety concerns could be addressed with a modest remodel.

List the average number of discipline/program sections scheduled in this room each semester, and the total number of students enrolled in these sections.

Sections:  0.5  Students:  20
List classroom or instructional space name/number: **PS 105**

Check if any of the following are not adequate:

- [ ] Ventilation / room temp
- [x] ADA access
- [ ] Number of seats / work stations
- [ ] Technology (computers, projectors, internet)
- [ ] Other (briefly describe):

Describe the specific action and estimated cost (if available) to make this space adequate for your instructional needs:
ADA concerns should be mitigated with a new Academic building. However, ADA and safety concerns could be addressed with a modest remodel.

List the average number of discipline/program sections scheduled in this room each semester, and the total number of students enrolled in these sections.
Sections: 2 lab sections
Students: 40
List classroom or instructional space name/number: **PS 106**

Check if any of the following are not adequate:

- Ventilation / room temp
- ADA access
- Number of seats / work stations
- Technology (computers, projectors, internet)
- □ Other (briefly describe):

  **Not enough room for 24 students to work safely.**

Describe the specific action and estimated cost (if available) to make this space adequate for your instructional needs:

Need projector mounted to ceiling and laptop mounted to desk for Power Point and internet access. Would also benefit from document camera. Estimated cost for equipment is $3000. Safety and ADA concerns should be mitigated with a new Academic building. However, ADA and safety concerns could be addressed with a modest remodel.

List the average number of discipline/program sections scheduled in this room each semester, and the total number of students enrolled in these sections.

Sections: 2 lab sections  Students: 40
List classroom or instructional space name/number: **PS 108**

Check if any of the following are not adequate:

- [x] Ventilation / room temp
- [x] ADA access
- [ ] Number of seats / work stations
- [ ] Technology (computers, projectors, internet)
- [x] Other (briefly describe):
  
  Not enough room for 24 students to work safely.

Describe the specific action and estimated cost (if available) to make this space adequate for your instructional needs:

Need projector mounted to ceiling and laptop mounted to desk for Power Point and internet access. Estimated cost for equipment is $2400. Safety and ADA concerns should be mitigated with a new Academic building. However, ADA and safety concerns could be addressed with a modest remodel.

List the average number of discipline/program sections scheduled in this room each semester, and the total number of students enrolled in these sections.

Sections: 2 lab sections, 2 lecture

Students: 100
Facilities, and Classroom Technology Form
Program/Disciplines: Chem/Physc
Year: 2008-09
Submitted by: Sartori

List classroom or instructional space name/number: PS 112

Check if any of the following are not adequate:

☐ Ventilation / room temp  ☑ ADA access  ☐ Number of seats / work stations  ☐ Technology (computers, projectors, internet)

☑ Other (briefly describe):

   Desk for technician is in the chemical storage area. This is a safety hazard.

Describe the specific action and estimated cost (if available) to make this space adequate for your instructional needs:
ADA and safety concerns should be mitigated with a new Academic building. However, ADA and safety concerns could be addressed with a modest remodel.

List the average number of discipline/program sections scheduled in this room each semester, and the total number of students enrolled in these sections.
Sections: 0, but supports about five  Students: 110 sections per semester