COLLEGE OF THE REDWOODS | PROGRAM REVIEW

Instructional Program Review Template

Year : 2017-2018

Plan Type: (select a plan type)

Program : Physical Sciences

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Program Information | Data Analysis | Critical Reflection of Assessment Activities | Evaluation of Previous Plans | Planning | Resource Requests | Author Feedback | PRC Response

Curriculum & Assessment Data

Assessment (click here to go to the assessment planning page)

Upcoming Assessments (plan)

Course	Outcome	Last Assessed	2020F	2021S	2021F	2022S	2022F	2023S	2023F	2024S
ASTRO-10	1	2017S	☐	☐	☑	☐	☐	☐	☐	☐
ASTRO-10	2	2018S	☐	☐	☑	☐	☐	☐	☐	☐
ASTRO-10	3	2019S	☐	☐	☑	☐	☐	☐	☐	☐
ASTRO-10	4	2013-2014	☐	☐	☑	☐	☐	☐	☐	☐
ASTRO-11	1	2017F	☐	☐	☐	☑	☐	☐	☐	☐

ASTRO-11	2	2018S	☐	☐	☐	☑	☐	☐	☐	☐
ASTRO-11	3	2018F	☐	☐	☐	☑	☐	☐	☐	☐
ASTRO-11	4	2019F	☐	☐	☐	☑	☐	☐	☐	☐
ASTRO-30	1	2017S	☐	☐	☐	☐	☑	☐	☐	☐
ASTRO-30	2	2018F	☐	☐	☐	☐	☑	☐	☐	☐
ASTRO-30	3	New	☐	☐	☐	☐	☑	☐	☐	☐
ASTRO-99	1	2019S	☐	☐	☐	☐	☐	☑	☐	☐
CHEM-100	1	2019F	☐	☐	☑	☐	☐	☐	☐	☐
CHEM-100	2	2019S	☐	☐	☑	☐	☐	☐	☐	☐
CHEM-100	3	2017F	☐	☐	☑	☐	☐	☐	☐	☐
CHEM-1A	1	2019F	☐	☐	☑	☐	☐	☐	☐	☐
CHEM-1A	2	2019S	☐	☐	☑	☐	☐	☐	☐	☐
CHEM-1B	1	2018S	☐	☐	☐	☑	☐	☐	☐	☐
CHEM-1B	2	2019S	☐	☐	☐	☑	☐	☐	☐	☐
CHEM-2	1	2018F	☐	☐	☑	☐	☐	☑	☐	☐
CHEM-2	2	2019S	☐	☐	☑	☐	☐	☑	☐	☐
CHEM-2	3	2019F	☐	☐	☑	☐	☐	☑	☐	☐
CHEM-2	4	2018S	☐	☐	☑	☐	☐	☑	☐	☐
CHEM-3	1	2017S	☐	☐	☐	☑	☐	☐	☐	☑
CHEM-3	2	2018S	☐	☐	☐	☑	☐	☐	☐	☑
CHEM-3	3	2015-2016	☐	☐	☐	☑	☐	☐	☐	☑
CHEM-3	4	2017S	☐	☐	☐	☑	☐	☐	☐	☑
CHEM-3	5	New	☐	☐	☐	☑	☐	☐	☐	☑
CHEM-3	6	New	☐	☐	☐	☑	☐	☐	☐	☑

ENVSC-12	1	2016F	☐	☐	☑	☐	☐	☐	☐	☐
ENVSC-12	2	2017F	☐	☐	☑	☐	☐	☐	☐	☐
ENVSC-12	3	2018F	☐	☐	☑	☐	☐	☐	☐	☐
ENVSC-12	4	2019F	☐	☐	☑	☐	☐	☐	☐	☐
GEOG-1	1	2017S	☐	☐	☑	☐	☐	☐	☑	☐
GEOG-1	2	2018F	☐	☐	☑	☐	☐	☐	☑	☐
GEOG-1	3	2013-2014	☐	☐	☑	☐	☐	☐	☑	☐
GEOG-1	4	2019F	☐	☐	☑	☐	☐	☐	☑	☐
GEOL-1	1	2019S	☐	☐	☑	☐	☐	☐	☐	☐
GEOL-1	2	2016F	☐	☐	☑	☐	☐	☐	☐	☐
GEOL-1	3	2018F	☐	☐	☑	☐	☐	☐	☐	☐
GEOL-1	4	2019F	☐	☐	☑	☐	☐	☐	☐	☐
GEOL-10	1	2016F	☑	☐	☐	☐	☐	☐	☐	☐
GEOL-10	2	2017F	☑	☐	☐	☐	☐	☐	☐	☐
GEOL-10	3	2018F	☑	☐	☐	☐	☐	☐	☐	☐
GEOL-15	1	2013-2014	☐	☐	☐	☐	☑	☐	☐	☐
GEOL-15	2	2013-2014	☐	☐	☐	☐	☑	☐	☐	☐
GEOL-15	3	2013-2014	☐	☐	☐	☐	☑	☐	☐	☐
GEOL-2	1	2017S	☐	☐	☐	☑	☐	☐	☐	☐
GEOL-2	2	2017S	☐	☐	☐	☑	☐	☐	☐	☐
GEOL-2	3	2018S	☐	☐	☐	☑	☐	☐	☐	☐
GEOL-2	4	2018S	☐	☐	☐	☑	☐	☐	☐	☐
OCEAN-10	1	2017S	☐	☑	☐	☐	☐	☑	☐	☐
OCEAN-10	2	2014-2015	☐	☑	☐	☐	☐	☑	☐	☐

OCEAN-10	3	2014-2015	☐	☑	☐	☐	☐	☑	☐	☐
OCEAN-10	4	2014-2015	☐	☑	☐	☐	☐	☑	☐	☐
OCEAN-12	1	2015-2016	☐	☐	☑	☐	☐	☐	☐	☐
OCEAN-12	2	2015-2016	☐	☐	☑	☐	☐	☐	☐	☐
OCEAN-12	3	2015-2016	☐	☐	☑	☐	☐	☐	☐	☐
OCEAN-12	4	2015-2016	☐	☐	☑	☐	☐	☐	☐	☐
PHYS-10	1	2019F	☐	☐	☐	☐	☑	☐	☐	☐
PHYS-10	2	2017F	☐	☐	☐	☐	☑	☐	☐	☐
PHYS-10	3	2018F	☐	☐	☐	☐	☑	☐	☐	☐
PHYS-10	4	2018F	☐	☐	☐	☐	☑	☐	☐	☐
PHYS-2A	1	2015-2016	☑	☐	☐	☐	☐	☐	☑	☐
PHYS-2A	2	2017F	☑	☐	☐	☐	☐	☐	☑	☐
PHYS-2A	3	2015-2016	☑	☐	☐	☐	☐	☐	☑	☐
PHYS-2A	4	2019F	☑	☐	☐	☐	☐	☐	☑	☐
PHYS-2B	1	2015-2016	☐	☐	☐	☑	☐	☐	☐	☑
PHYS-2B	2	2017S	☐	☐	☐	☑	☐	☐	☐	☑
PHYS-2B	3	2015-2016	☐	☐	☐	☑	☐	☐	☐	☑
PHYS-2B	4	2015-2016	☐	☐	☐	☑	☐	☐	☐	☑
PHYS-4A	1	2015-2016	☐	☑	☐	☐	☐	☑	☐	☐
PHYS-4A	2	2018S	☐	☑	☐	☐	☐	☑	☐	☐
PHYS-4A	3	2015-2016	☐	☑	☐	☐	☐	☑	☐	☐
PHYS-4A	4	New	☐	☑	☐	☐	☐	☑	☐	☐
PHYS-4B	1	2015-2016	☑	☐	☐	☐	☑	☐	☐	☐
PHYS-4B	2	2017F	☑	☐	☐	☐	☑	☐	☐	☐

PHYS-4B	3	2015-2016	☑	☐	☐	☐	☑	☐	☐	☐
PHYS-4B	4	2019F	☑	☐	☐	☐	☑	☐	☐	☐
PHYS-4C	1	2015-2016	☐	☑	☐	☐	☐	☑	☐	☐
PHYS-4C	2	2017S	☐	☑	☐	☐	☐	☑	☐	☐
PHYS-4C	3	2018S	☐	☑	☐	☐	☐	☑	☐	☐
PHYS-4C	4	2015-2016	☐	☑	☐	☐	☐	☑	☐	☐

What courses, if any, are not on track with regard to a 4-year assessment cycle? Explain if this is a consequence of how often the course is offered or other mitigating factors such as outcome updates that may have changed the assessment cycle.

All physical science courses are on track with regards to the 4-year cycle and have current assessments.
Astro 15A, Astro 99 have not been taught during the current assessment cycle and both have been inactivated (although they are still shown on the planning page).
Chem 10 - has not been taught during the current assessment cycle (or in the last 5 years). Therefore no assessments have been conducted.

All program level assessments are on track with regard to the 4-year assessment cycle. PLOs were assessed for the AS-T Geology, AS-T Physics, Liberal Arts - Science, and Liberal Arts - Science Exploration degrees.

# of course SLO reports submitted during 2016-2017. 34

# of degree/cert PLO reports submitted during 2016-2017. 5

Curriculum

Course	Course Outline of Record Approval Date	Status	Online Approval Date	Status	Interactive TV Approval Date	Status

88 % of Course Outlines of Record up to date.

Explain any mitigating circumstances.

Indicate if you have submitted updated Course Outlines of Record this fall.

If there is no plan for updating outdated curriculum, when will you inactivate?

All course outlines are up to date.

The Dean will be working with the part-time Oceanography instructor to provide updates for those CORs. The Del Norte Geology faculty will be working on the update of the online approval for Geology 10.

Did the Program Advisory Committee meet in the last year? (select response)

3.1 What changes have been made to the program based on assessment findings? You may include results from your closing the loop reports that map to your program.

The Fall 2016 assessment of the Liberal Arts Science outcome #1 (PLO #1 - Scientific Method) led to a discussion regarding the need for functional equipment in the Science labs. The group stated: It should be noted that part of the power and the limitations of the scientific method come from interactions of the scientist with equipment. As technological advances are made, we must be able to train our students on current methods and with modern equipment. Course assessment data will be used to justify equipment and resource requests through Program Review. This assessment if the basis for the equipment request included in this program review.

Similar observations in the Physics courses led to the request (and approval) of materials for a rotational physics laboratory lesson. The physics professor is in the process of assessing the outcome related to this equipment. The loop for this request remains open.

3.2 Describe assessment findings/observations that may require further research or institutional support.

The geology faculty have been using the program outcome assessment results to discuss the possible need for prerequisites for the Historical Geology course. A change has not yet been made, but the faculty will continue to monitor this issue as all PLOs are assessed for the next few years. All course-level assessments have been generally successful, but faculty have noted a distinct difference between the performance of students who have taken physical geology (especially at CR) and ones who have not.

The Chemistry Faculty used the assessment results from Chem 1A, CLO #2 to consider addition if the existing chemistry course prerequisite is adequate. The action they included in the Spring 2017 assessment report is: We need to determine if the chemistry prereq is adequate. So, I propose that we call SMJC and get their prereq info. Collect CCDT data and determine if this is a good predictor of success.

The assessment of Chemistry 1B has also led to the suggestion to: "Look for and setup online homework system". This requires research and will be part of a planning item.

Assessment of Physics 2A in Fall `16 observed a significantly lower performance in CLO #3 and suggests that this may be connected with the inability to do demonstrations in the new classroom because the natural gas outlets were not completed. The lines are in the classroom, but outlets were not installed.

Assessments of Physics 2B in Spring `17 identified two issues that require support. Assessment of CLO # 2 suggests better equipment for students to learn how to analyze circuits with Kirchhoff`s rules. Assessment of CLO # 5 identifies a need for equipment to help students answer questions about X-ray generation, which is central to the outcome and of particular importance for students taking the course with the intent of a career in medicine.

Assessments of Physics 4C in Spring `17 identified two issues that require support. Assessment of CLO #2 suggests the need for a demonstration related to adiabatic processes, which should be inexpensive, to help students understand the process and the math that describes it better to address a deficit in ability identified in the assessment. Assessment of CLO #4 suggests that development of a lab more directly related to quantum mechanics is needed. It is noted that this course is a capstone for the

Summary of Section 3
How will your assessment findings impact planning for the next year?

The assessment of the Scientific Method outcome for the Liberal Arts Science degree (PLO#1 - referenced above) is the basis of requesting specific course equipment to aid students in exploring the connection of experimentation with scientific inquiry. This includes the request to acquire pocket transits for lab exercises at the Del Norte Campus.

Assessments of Historical Geology outcomes has led to the following observation: In a couple of cases, low-quality samples were in the lab and students were then less able to identify the same fossil type on the lab exams. A similar experience occurred for some of the rock types. Because many of the good samples are set aside for Physical Geology, there are fewer samples available for Historical Geology.
This situation could be vastly improved by a modest purchase of additional fossil and rock samples. This has been the basis for prior program review requests, and efforts to continue building the lab .

The assessment of Chemistry 1B has also led to the suggestion to: "Look for and setup online homework system". This requires research and will be part of a planning item.
collections will continue with future requests.

Multiple assessments of physics courses identifying achievement deficits will lead to plans related to what was identified. Most, but not all, plans will also suggest resource requests.

The General Education, Area A assessment led to dialogue concerning the ability of science students to express themselves in writing. A plan to address this issue and to work with life science faculty on faculty resources and training is the basis for a planning item in this program review.

The dialogue session of Institutional Outcome #1 (ILO #1 dialogue at Spring 2017 Flex session) led to a proposal that all areas with ADTs should come up with a plan for the next program review cycle to promote their ADTs. The Physical Sciences has followed up on this dialogue-derived directive and has included a plan for providing promotional flyers for both the Geology and Physics AS-T degrees. This is combined with the request to include "magazine style" racks in the academic buildings to promote these