Subject Area Committee Name: PHY

Core Outcome Being Assessed: PC

Contact Person:

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| Name | e-mail |
| Leonid Minkin | lminkin@pcc.edu |

Use this form if your assessment project is a follow-up reassessment of a previously completed initial assessment. The basic model we use for core outcome assessment at PCC is an “assess – address – reassess” model.

The primary purpose for yearly assessment is to improve student learning. We do this by seeking out areas of concern, making changes, reassessing to see if the changes helped.

Only one assessment or reassessment report is required this year. Document your plan for this year’s assessment report(s) in the first sections of this form. This plan can be consistent with the Multi-Year Plan you have submitted to the LAC, though, this year, because PCC is engaging in a year-long exploration of our core outcomes and general education program, SACs are encouraged to explore/assess other potential outcomes. If reassessing, complete each section of this form. In some cases, all of the information needed to complete the section may not be available at the time the report is being written. In those cases, include the missing information when submitting the completed report at the end of the year.

* Refer to the help document for guidance in filling-out this report. If this document does not address your question/concern, contact [Chris Brooks](mailto:christopher.brooks3@pcc.edu) to arrange for coaching assistance.
* Please attach all rubrics/assignments/etc. to your report submissions.
* **Subject Line of Email:** Assessment Report Form (or ARF) for <your SAC name> (Example: ARF for MTH)
* **File name:** SACInitials\_ARF\_2016 (Example: MTH\_ARF\_2016)
* SACs are encouraged to share this report with their LAC coach for feedback before submitting.
* Make all submissions to [learningassessment@pcc.edu](mailto:learningassessment@pcc.edu).

### Due Dates:

* **Planning Sections of LAC Assessment or Reassessment Reports: November 16th, 2015**
* **Completed LAC Assessment or Reassessment Reports: June 17th, 2016**

Please Verify This Before Beginning this Report:

This project is the second stage of the assess/re-assess process (if this is not a follow-up, re-assessment project, use the LAC Assessment Report Form LDC. Available at: <http://www.pcc.edu/resources/academic/learning-assessment/LDC_Assessment_Templates.html>

**Initial Assessment Project Summary (previously completed assessment project)**

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| Briefly summarize the main findings of your initial assessment. Include either 1) the frequencies (counts) of students who attained your benchmarks and those who did not, or 2) the percentage of students who attained your benchmark(s) and the size of the sample you measured:  128 students gave the answer to the question "How do you think studying physics will help you in your professional life?" The end of the term answers were compared and contrasted with the beginning of the term answers. The results were quantitatively judges by comparing the number of responses citing the course as a requirement versus the number of responses citing specific course topics that related to a student's particular field. |
| Briefly summarize the changes to instruction, assignments, texts, lectures, etc. that you have made to address your initial findings:  The results of this study were so encouraging that it is hard to recommend any changes. However the following suggestions are offered:  1. Physics instructors should continue to integrate more examples involving applications to specific professions since students find these so helpful, and since this follows how relevant Physics is to our everyday lives.  2. Instructors should also stay informed as to which PCC degree programs require Physics courses so that we can offer pertinent information and examples in our courses. |
| If you initially assessed students in courses, which courses did you assess:  PHY 101, PHY 201, PHY 202, PHY 211, and PHY 212 |
| If you made changes to your assessment tools or processes for this reassessment, briefly describe those changes here:  No changes were made. We want to be able to compare our results with earlier study so we opted to keep the test identical to the first version. |

**1. Core Outcome**

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| 1A. PCC Core Outcome: | PC |
| 1B. The Core Outcomes can look different in different disciplines and courses. For example, professional competence in math might emphasize the procedural skills needed for the next course; professional competence in psychology might emphasize the ability to interpret the meaning of some basic statistics. Briefly describe how your SAC will be identifying and measuring your students’ attainment of this core outcome below. | |
| Demonstrate and apply the knowledge, skills and attitudes necessary to enter and succeed in a defined profession or advanced academic program | |
| 1C. Ideally, assessment projects are driven by faculty curiosity about student learning (e.g., are they really getting what is expected in this course?). Briefly share how/why the faculty expectation assessed in this report is useful to your students. Continuing with the above examples, if math students do not have the expected procedural skills for the next course, they may not be successful; psychology students are required to read and understand peer-reviewed research in the next course – so the ability to interpret basic statistics is essential for success in the next course. | |
| Physics is fundamental for all natural sciences and engineering and therefore deep competence and its relevance to students' future professions must be demostrated in physics courses. | |

**2. Project Description**

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| 2A. Assessment Context |
| ***Check all the applicable items:*** |
| **Course based assessment.**  Course names and number(s): PHY 202, PHY 203, PHY 212, PHY 213  Expected number of sections offered in the term when the assessment project will be conducted:  Number of these sections taught by full-time instructors: 10  Number of these sections taught by part-time instructors: 7  Number of distance learning/hybrid sections: 0  Type of assessment (e.g., essay, exam, speech, project, etc.): pre and post servey  Are there course outcomes that align with this aspect of the core outcome being investigated?  Yes  No  If yes, include the course outcome(s) from the relevant CCOG(s):  **Common/embedded assignment in all relevant course sections.** An embedded assignment is one that is already included as an element in the course as usually taught. Please attach the activity in an appendix. If the activity cannot be shared, indicate the type of assignment (e.g., essay, exam, speech, project, etc.):  **Common – but not embedded - assignment used in all relevant course sections.** Please attach the activity in an appendix. If the activity cannot be shared, indicate the type of assignment (e.g., essay, exam, speech, project, etc.):  **Practicum/Clinical work.** Please attach the activity/checklist/etc. in an appendix. If this cannot be shared, indicate the type of assessment (e.g., supervisor checklist, interview, essay, exam, speech, project, etc.):  **External certification exam.** Please attach sample questions for the relevant portions of the exam in an appendix (provided that publically revealing this information will not compromise test security). Also, briefly describe how the results of this exam are broken down in a way that leads to nuanced information about the aspect of the core outcome that is being investigated.    **SAC-created, non-course assessment.** Please attach the assessment in an appendix. If the assessment cannot be shared, indicate the type of assignment (e.g., essay, exam, speech, project, etc.):  **Portfolio.** Please attach sample instructions/activities/etc. for the relevant portions of the portfolio submission in an appendix. Briefly describe how the results of this assessment are broken down in a way that leads to nuanced information about the aspect of the core outcome that is being investigated:  **Survey**  **Interview**  **Other.** Please attach the activity/assessment in an appendix. If the activity cannot be shared, please briefly describe:  In the event publically sharing your assessment documents will compromise future assessments or uses of the assignment, do not attach the actual assignment/document. Instead, please give as much detail about the activity as possible in an appendix. |
| 2B. How will you score/measure/quantify student performance?  **Rubric** (used when student performance is on a continuum - if available, attach as an appendix – if in development - attach to the completed report that is submitted in June)  **Checklist** (used when presence/absence rather than quality is being evaluated - if available, attach as an appendix – if in development - attach to the completed report that is submitted in June)  **Trend Analysis** (often used to understand the ways in which students are, and are not, meeting expectations; trend analysis can complement rubrics and checklist)  **Objective Scoring** (e.g., Scantron scored examinations)  **Other** – briefly describe: |
| 2C. Type of assessment (select one per column)  **Quantitative**   **Direct Assessment**  **Qualitative**   **Indirect Assessment**    If you selected ‘Indirect Assessment’, please share your rationale:  **Qualitative Measures: projects that analyze in-depth, non-numerical data via observer impression rather than via quantitative analysis. Generally, qualitative measures are used in exploratory, pilot projects rather than in true assessments of student attainment. Indirect assessments (e.g., surveys, focus groups, etc.) do not use measures of direct student work output. These types of assessments are also not able to truly document student attainment.** |
| 2D. Check any of the following that were used by your SAC to create or select the assessment/scoring criteria/instruments used in this project:  Committee or subcommittee of the SAC collaborated in its creation  Standardized assessment  Collaboration with external stakeholders (e.g., advisory board, transfer institution/program)  Theoretical Model (e.g., Bloom’s Taxonomy)  Aligned the assessment with standards from a professional body (for example, The American Psychological Association Undergraduate Guidelines, etc.)  Aligned the benchmark with the Associate’s Degree level expectations of the Degree Qualifications Profile  Aligned the benchmark to within-discipline post-requisite course(s)  Aligned the benchmark to out-of-discipline post-requisite course(s)  Other (briefly explain:      ) |
| 2E. In which quarter will student artifacts (examples of student work) be collected? If student artifacts will be collected in more than one term, check all that apply.  **Fall**  **Winter**  **Spring**  **Other** (e.g., if work is collected between terms) |
| 2F. When during the term will it be collected? If student artifacts will be collected more than once in a term, check all that apply.  **Early**  **Mid-term**  **Late**  **n/a** |
| 2G. What student group do you want to generalize the results of your assessment to? For example, if you are assessing performance in a course, the student group you want to generalize to is ‘all students taking this course.’  All students taking PHY 202-203 and PHY 212-213 levels |
| 2H. There is no single, recommended assessment strategy. Each SAC is tasked with choosing appropriate methods for their purposes. Which best describes the purpose of this project?    **To measure established outcomes and/or drive programmatic change (proceed to section H below)**  **To participate in the Multi-State Collaborative for Learning Outcomes Assessment**  **Preliminary/Exploratory investigation**  If you selected ‘Preliminary/Exploratory’, briefly describe your rationale for selecting your sample of interest (skip section H below). For example: “The SAC intends to add a Cultural Awareness outcome to this course in the upcoming year. 2 full-time faculty and 1 part-time faculty member will field-test 3 different activities/assessments intended to measure student attainment of this proposed course outcome. The 3 will be compared to see which work best.” |
| 2I. Which will you measure?  **the population** (all relevant students – e.g., all students enrolled in all currently offered sections of the course)  **a sample** (a subset of students)  If you are using a sample, select all of the following that describe your sample/sampling strategy (refer to the Help Guide for assistance):  **Random Sample** (student work selected completely randomly from all relevant students)  **Systematic Sample** (student work selected through an arbitrary pattern, e.g., ‘start at student 7 on the roster and then select every 5th student following’; repeating this in all relevant course sections)  **Stratified Sample** (more complex, consult with an LAC coach if you need assistance)  **Cluster Sample** (students are selected randomly from meaningful, naturally occurring groupings (e.g., SES, placement exam scores, etc.)  **Voluntary Response Sample** (students submit their work/responses through voluntary submission, e.g., via a survey)  **Opportunity/Convenience Sample** (only some of the relevant instructors are participating)  The last three options in bolded red have a high risk of introducing bias. If your SAC is using one or more of these sample/sampling strategies, please share your rationale:  **2J. Briefly describe the procedure you will use to select your sample (including a description of the procedures used to ensure student and instructor anonymity**. For example:  “We chose to use a random sample. We asked our administrative assistant to assist us in this process and she was willing. All instructors teaching course XXX will turn-in all student work to her by the 9th week of Winter Quarter. She will check that instructor and student identifying information has been removed. Our SAC decided we wanted to see our students’ over-all performance with the rubric criteria. Our administrative assistant will code the work for each section so that the scored work can be returned to the instructors (but only she will know which sections belong to which instructor). Once all this is done, I will number the submitted work (e.g., 1-300) and use a random number generator to select 56 samples (which is the sample size given by the Raosoft sample size calculator for 300 pieces of student work). After the work is scored, the administrative assistant will return the student work to individual faculty members. After this, we will set up a face-to-face meeting for all of the SAC to discuss the aggregated results.”  One of physics instructors will conduct "Monkey" survey which provides students' and instructors' anonymity. |
| 2K. Follow this link to determine how many artifacts (samples of student work) you should include in your assessment: <http://www.raosoft.com/samplesize.html> (see screen shot below). **Estimate the size of the group you will be measuring (either your sample or your population size [when you are measuring all relevant students]). Often, this can be based on recent enrollment information (last year, this term, etc.):**  92 |



**3. Project Mechanics**

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| 3A. Does your project utilize a rubric for scoring? | **Yes**   **No** | |
| If ‘No’, proceed to section B. If ‘Yes’, complete the following.  Multiple raters should always be used in SAC assessment projects that utilize rubrics or checklists. SACs have several options for ensuring that ratings are similar across each rater. The most time consuming option is for all raters to collectively rate and discuss each artifact until they reach 100% agreement on each score (this is called **consensus**). In most cases, SACs should consider a more efficient strategy that divides the work (a norming or calibrating session). During a norming session, all raters participate in a training where the raters individually score pre-selected student work and then discuss their reasons for giving the scores they chose. Disagreements are resolved and the process is repeated. When the participants feel they are all rating student work consistently, they then independently score additional examples of student work in the norming session (often 4-6 artifacts). The ratings for these additional artifacts are checked to see what percentage of the scores are in agreement (the standard is 70% agreement or higher). When this standard is reached in the norming session, the raters can then divide-up the student work and rate it independently. If your SAC is unfamiliar with norming procedures, contact [Chris Brooks](mailto:christopher.brooks3@pcc.edu) to arrange for coaching help for your SAC’s norming session.  Which method of ensuring consistent scoring (inter-rater reliability) will your SAC use for this project?  **Agreement** – the percentage of raters giving each artifact the same/similar score in a norming session  If you are using agreement, describe your plan for plan for conducting the “norming” or “calibrating” session:    **Consensus** - all raters score all artifacts and reach agreement on each score  Though rarely used at PCC, some SACs might occasionally use the consistency measure for determining the similarity of their ratings. Consistency is generally only recommended when measuring student improvement – not for showing outcome attainment (which explains its rarity). See the Help Guide for more information. Check here if you will be using consistency calculations in this assessment.  **Consistency\*** – raters’ scores are correlated: this captures relative standing of the performance ratings - but not precise agreement – and then briefly describe your plan: | | |
| 3B. Have performance benchmarks been specified?  The fundamental measure in educational assessment is the number of students who complete the work at the expected/required level. We are calling this SAC-determined performance expectation the ‘benchmark.’  **Yes** (determined by faculty consensus – all instructors who currently teach the course)  Yes (determined by only some of the instructors who currently teach the course)  **Yes** (determined by alignment with an external standard: e.g., standards published by the discipline’s professional organization)  **Yes** (determined by post-requisite course expectations within PCC)  **Yes** (determined by post-requisite course expectations for transfer institution)  **Yes** (other). Describe briefly:  **No**  If yes, briefly describe your performance benchmarks, being as specific as possible (if needed, attach as an appendix):    If no, what is the purpose of this assessment (for example, this assessment will provide information that will lead to developing benchmarks in the future; or, this assessment will lead to areas for more detailed study; etc.)?  We plan to do this study every five years and assess how the students' answers differ from the previous survey. | | |
| **3C. The purpose of this assessment is to have SAC-wide evaluation of student work, not to evaluate a particular instructor or student. Before evaluation, remove identifying student information (and, when possible remove instructor identifying information). If the SAC wishes to return instructor-specific results, see the Help Guide for suggestions on how to code and collate. Please share your process for ensuring that all identifying information has been removed.**  Survey will be provided by one of our instructors through "Monkey" survey system and will be presented for analysis in an anonymous form. Results are collated by course and instructor but final results will be presented only by course so there will be no published instructor information. Instructors may request their individual results if desired. These will be provided confidentially. | | |
| 3D. Will you be coding your data/artifacts in order to compare student sub-groups? | | **Yes**   **No** |
| If yes, select one of the boxes below:  **student’s total earned hours**  **previous coursework completed**  **ethnicity**   **other**  Briefly describe your coding plan and rationale (and if you selected ‘other’, identify the sub-groups you will be coding for: | | |
| 3E. Ideally, student work is **evaluated** by both full-time and adjunct faculty, even if students being assessed are taught by only full-time and/or adjunct faculty. Further, more than one rater is needed to ensure inter-rater reliability. If you feel only one rater is feasible for your SAC, please consult with an LAC coach prior to submitting your plan/conducting your assessment.  Other groups may be appropriate depending on the assessment. Check all that apply.  PCC Adjunct Faculty within the program/discipline  PCC FT Faculty within the program/discipline  PCC Faculty outside the program/discipline  Program Advisory Board Members  Non-PCC Faculty  External Supervisors  Other: | | |

**End of Planning Section – Complete the remainder of this report after your assessment project is complete.**

***Beginning of End of Year Reporting Section – complete the following sections after your assessment project is complete.***

1. Changes to the Assessment Plan

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| Have there been changes to your project since you submitted the planning section of this report?  **Yes**  **No**  If so, note the changes in the planning section above. |

5. Results of the Analysis of Assessment Project Data

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| 5A. Quantitative Summary of Sample/Population  How many students were enrolled in all sections of the course(s) you assessed this year?  If you did not assess in a course, report the number of students that are in the group you intend to generalize your results to.  How many students did you actually assessed in this project?  Did you use a recommended sample size (see the Sample Size Calculator linked to above)?  **Yes**   **No**  If you did not use a recommended sample size in your assessment, briefly explain why: |
| *5B. Did your project utilize a rubric for scoring?*   **Yes**   **No**  If ‘No’, proceed to section C. If ‘Yes’, complete the following.  How was inter-rater reliability assured? (Contact your SAC’s LAC Coach if you would like help with this.)  **Agreement** – the percentage of raters giving each artifact the same/similar score in a norming session  **Consensus** - all raters score all artifacts and reach agreement on each score  **Consistency** – raters’ scores are correlated: this captures relative standing of the performance ratings - but not precise agreement  **Inter-rater reliability was not assured.**  If you utilized agreement or consistency measures of inter-rater reliability, report the level here: |
| 5C. Brief Summary of Your Results  In most cases, report the numbers of students who attain your benchmark level and the numbers who do not. **Do not average these numbers or combine dissimilar categories (e.g., do not combine ratings for communication and critical thinking together).** If your project measures how many students attain the overall benchmark level of performance, report the summary numbers below (choose one):   1. If you used frequencies (the actual number who attained the desired level(s) and the actual number who did not), report those here for each of your criteria for this learning outcome. For example, “54 students attained the benchmark level over-all in written communication and 7 did not. Our SAC used 5 criteria within this rubric: 54 student achieved the benchmark level in idea expression (7 did not); 54 achieved the benchmark level for use of standard English (10 did not); etc.”      1. If your project used percentages of the total to identify the degree of benchmark attainment in this project, report those here for each of your criteria for this learning outcome. For example, “89% of 61 students attained the benchmark level over-all in written communication. Our SAC used 5 criteria within this rubric: 89% of students achieved the benchmark level in idea expression; 89% achieved the benchmark level for use of standard English; etc.”      1. Compare your students’ attainment of your expectations/benchmarks in this reassessment with their attainment in the initial assessment. Briefly summarize your conclusions. |
| 5D. Attach a more detailed description or analysis of your results (e.g., rubric scores, trend analyses, etc.) as an appendix to this document. Appendix attached?  **Yes**   **No** |
| 5E. What did the SAC learn about your students’ attainment of your important benchmarks from this reassessment? For example, “We are pleased that most of our students are using standard English in their writing, and want to improve our students’ ability to express ideas clearly. We found significant improvements in the reassessment as a result of the changes in instruction and assignments that we made this year….” |
| 5F. Do the results of this project suggest that additional academic changes might be beneficial to your students (changes in curriculum, content, materials, instruction, pedagogy etc.)?  Yes  No  If you answered ‘Yes,’ briefly describe the changes to improve student learning below. If you answered ‘No’, detail why no changes are called for.    If you are planning changes, when will these changes be fully implemented? |
| 5G. Has all identifying information been removed from your documents? (Information includes student/instructor/supervisor names/identification numbers, names of external placement sites, etc.)  **Yes**  **No** |

6. SAC Response to the Assessment Project Results

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| 6A. Assessment Tools & Processes: Indicate how well each of the following worked for your assessment:  Tools (rubrics, test items, questionnaires, etc.):  very well  some small problems/limitations to fix  notable problems/limitations to fix  tools completely inadequate/failure  Please comment briefly on any changes to assessment tools that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome).    Processes (faculty involvement, sampling, norming, inter-rater reliability, etc.):  very well  some small problems/limitations to fix  notable problems/limitations to fix  tools completely inadequate/failure  Please comment briefly on any changes to assessment process that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). |

7. Follow-Up Plan

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| 7A. How will the changes detailed in this report be shared with all FT/PT faculty in your SAC? (select all that apply) | | | |
| email  campus mail  *no changes to share* | phone call  face-to-face meeting | | workshop  other |
| If ‘other,’ please describe briefly below. | | | |
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| 7B. Is further collaboration/training required to properly implement the identified changes?  Yes  No | | | |
| If ‘Yes,’ briefly detail your plan/schedule below. | | | |
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| 7C. Sometimes reassessment projects call for additional reassessments. These can be formal or informal. How will you assess the effectiveness of the changes you plan to make? | | | |
| follow-up project in next year’s annual report | | on-going informal assessment | |
| in a future assessment project | | other | |
| If ‘other,’ please describe briefly below. | | | |
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| 7D. SACs are learning how to create and manage meaningful assessments in their courses. This development may require SAC discussion to support the assessment process (e.g., awareness, buy-in, communication, etc.). Please briefly describe any successful developments within your SAC that support the quality assessment of student learning. If challenges remain, these can also be shared. | | | |