

Assessment: PSME PLO Assessments (4/24/2018)



Dept - (PSME) Astronomy

<i>Program Level Outcomes (PLOs)</i>	<i>Assessment Methods</i>	<i>Assessment Data Summaries</i>	<i>Enhancements</i>
<p>ASTR_PLO_1 - Appraise the benefits to society of astronomical research. PLO Status: Active Year(s) to be Assessed: 2013-2014</p>	<p>Exam - Course Test/Quiz - Multiple-choice questions Target for Success: 65%</p>	<p>Program Review Reporting Year: 2013-2014 Target : Target Met SLO 1 in both Astronomy 4 and Astronomy 10 satisfy this PLO. Thus, the assessments in those courses as related in TracDat are also assessments of this PLO. (04/18/2014) Reflection (CLICK ON ? FOR INSTRUCTIONS): As with all the other data gathered in this first round of assessments, there is still more discussion going on about the data gathering itself than about what to do on the basis of the data. In particular, we need to find a way to be more uniform in our data gathering in the future in order not to be “comparing apples and oranges” and to establish a meaningful baseline. Two issues are particularly problematic for us in the data gathering we have done in this first round for both Astronomy 4 and Astronomy 10: different testing formats and different times during the quarter when assessments were done. Testing formats: The four of us who teach Astronomy courses use three different formats of “bubble sheet” exams. Two use conventional “one best answer” multiple choice exams. One (Dr. Cichanski) uses an innovative format in which some partial credit is given for certain not-optimum responses. The other (Mr. Harrington) uses a format in which students explicitly assess whether each answer in a single question group is right or wrong. We are having lively discussions about how to compare our scores in a meaningful way while preserving our individual testing</p>	<p>Enhancement: A more uniform protocol for gathering data will be formulated by the department, in which data will be gathered at the same time in the quarter (probably final exams) and differences in testing styles will be accommodated in a way that produces results that can legitimately be compared to one another. The latter will be helped significantly when and if functioning software is installed for the PSM&E Division’s new Insight 4es test sheet scanner from Scantron. (04/18/2014)</p>

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methods.
Times of assessment: The Astronomy 10 assessments were conducted on midterm exams, in which students were being tested on the material for the first time. The Astronomy 4 assessments were conducted on a comprehensive final exam, so students were being tested on most of the material for at least a second time. Scores on the latter are likely to be higher than on the former, and that is borne out in the results. This will be an easier issue to fix in the future than the disparate test formats issue will be.

ASTR_PLO_2 - Evaluate the impact on Earth's characteristics of the evolution of the solar system, stars, and stellar systems.

PLO Status: Active

Year(s) to be Assessed: 2013-2014

Exam - Course Test/Quiz - Multiple-choice questions

Target for Success: 65%

Program Review Reporting Year: 2013-2014

Target : Target Met

SLO 2 in both Astronomy 4 and Astronomy 10 satisfy this PLO. Thus, the assessments in those courses as related in TracDat are also assessments of this PLO. (04/18/2014)
Reflection (CLICK ON ? FOR INSTRUCTIONS): As with all the other data gathered in this first round of assessments, there is still more discussion going on about the data gathering itself than about what to do on the basis of the data. In particular, we need to find a way to be more uniform in our data gathering in the future in order not to be "comparing apples and oranges" and to establish a meaningful baseline.

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		<p>in a meaningful way while preserving our individual testing methods.</p> <p>Times of assessment: The Astronomy 10 assessments were conducted on midterm exams, in which students were being tested on the material for the first time. The Astronomy 4 assessments were conducted on a comprehensive final exam, so students were being tested on most of the material for at least a second time. Scores on the latter are likely to be higher than on the former, and that is borne out in the results. This will be an easier issue to fix in the future than the disparate test formats issue will be.</p>	
<p>ASTR_PLO_3 - Evaluate astronomical news items or theories about astronomy based upon the scientific method.</p> <p>PLO Status: Active</p> <p>Year(s) to be Assessed: 2013-2014</p>	<p>Exam - Course Test/Quiz - Multiple-choice test questions</p> <p>Target for Success: 65%</p>	<p>Program Review Reporting Year: 2013-2014</p> <p>Target : Target Met</p> <p>SLO 3 in both Astronomy 4 and Astronomy 10 satisfy this PLO. Thus, the assessments in those courses as related in TracDat are also assessments of this PLO. (04/18/2014)</p> <p>Reflection (CLICK ON ? FOR INSTRUCTIONS): As with all the other data gathered in this first round of assessments, there is still more discussion going on about the data gathering itself than about what to do on the basis of the data. In particular, we need to find a way to be more uniform in our data gathering in the future in order not to be “comparing apples and oranges” and to establish a meaningful baseline.</p> <p>Two issues are particularly problematic for us in the data gathering we have done in this first round for both Astronomy 4 and Astronomy 10: different testing formats and different times during the quarter when assessments were done.</p> <p>Testing formats: The four of us who teach Astronomy courses use three different formats of “bubble sheet” exams. Two use conventional “one best answer” multiple choice exams. One (Dr. Cichanski) uses an innovative format in which some partial credit is given for certain not-optimum responses. The other (Mr. Harrington) uses a format in which students explicitly assess whether each answer in a single question group is right or wrong. We are</p>	<p>Enhancement: A more uniform protocol for gathering data will be formulated by the department, in which data will be gathered at the same time in the quarter (probably final exams) and differences in testing styles will be accommodated in a way that produces results that can legitimately be compared to one another. The latter will be helped significantly when and if functioning software is installed for the PSM&E Division’s new Insight 4es test sheet scanner from Scantron. (04/18/2014)</p>

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Assessment: PSME PLO Assessments (4/24/2018)



Dept - (PSME) Chemistry

For 2017-18 Submitted by:: Erik Woodbury

<i>Program Level Outcomes (PLOs)</i>	<i>Assessment Methods</i>	<i>Assessment Data Summaries</i>	<i>Enhancements</i>
<p>CHEM_PLO_1 - Demonstrate an understanding of the scientific methods and utilize the method in a laboratory setting. PLO Status: Active Year(s) to be Assessed: 2012-2013, 2013-2014 Outcome Creation Date: 04/23/2014</p>	<p>Exam - Course Test/Quiz - Laboratory exams from two classes, CHEM 1A (Fall 2013), and CHEM 1C (Spring 2013) were used for this assessment.</p> <p>CHEM 1A Assessment: Students were provided data from six of the experiments conducted during the quarter. The students were asked to perform the calculations pertaining to each of the experiments and the results obtained were evaluated for accuracy. One sample question is provided below:</p> <p>1. Vinegar titration: The following data was obtained when determining the percentage of acetic acid in vinegar. Using the data provided, determine a) (5 points) the molarity of the KHP solution b) (5 points) the molarity of the NaOH solution and c) (10 points) the percentage of acetic acid in vinegar.</p> <p>DATA</p>	<p>Program Review Reporting Year: 2013-2014 Target : Target Met CHEM 1A: 72/100 CHEM 1C: 92/100 (04/23/2014) Reflection (CLICK ON ? FOR INSTRUCTIONS): In both of the classes, the assessment demonstrated that the target for success was met.</p> <p>CHEM 1A is the entry-level freshman chemistry class. About half the students in this class are in a college-chemistry laboratory for the first time. The other half of the students has met the pre-requisite by passing CHEM 50, the preparation class for General Chemistry. Even though the average score on this assessment meets the target established for success, we feel that the success can be definitely improved. At this point, we are not able to indentify if there is any difference in the performance of the students who have entered CHEM 1A by passing CHEM 50 and those who have entered CHEM 1A by passing the placement test. We are currently working with institutional research to obtain the relevant data. This data will enable us to identify the specific areas that we will focus our attention on to improve the success percent in this class.</p> <p>CHEM 1C is the third and final quarter of the General Chemistry sequence. At this point, all students should be experienced in several common chemistry laboratory techniques. They average assessment score reflects this</p>	<p>Enhancement: Identify if there is any difference in the success of students who have entered CHEM 1A by passing CHEM 50 and those who have entered CHEM 1A by passing the placement test through data provided by institutional research. (04/23/2014)</p>

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	<p>Mass of KHP (H₅C₂O₄K) = 0.5329 g Volume of KHP = 25.00 ml</p> <p>Standardization of NaOH:</p> <p>KHP Initial burette reading = 0.150 ml Final burette reading = 0.985 ml</p> <p>NaOH Initial burette reading = 0.275 ml Final burette reading = 1.320 ml</p> <p>Titration of vinegar:</p> <p>Vinegar Mass of empty flask = 37.8870 g Mass of flask + vinegar = 38.0792 g</p> <p>NaOH Initial burette reading = 0.175 ml Final burette reading = 1.670 ml</p> <p>CHEM 1C Assessment: This class is titled General Chemistry and Qualitative Analysis. In the qualitative analysis section of this class, which is taught exclusively in the laboratory, students analyze and identify unknown metal ions that are divided into four different groups. Students were assessed from their performance in a practical laboratory exam in which they were provided with a mixture of two unknown metal ions. The results provided by the students following the analysis were evaluated for the accuracy of the identity of the metal ion.</p>	<p>experience.</p> <p>Both of the assessments used to measure this program level outcome demonstrates that students are learning the scientific method and are able to successfully demonstrate the mastery of the scientific method by being able to analyze data as well as perform laboratory techniques.</p>	

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	<p>Target for Success: CHEM 1A: A grade of 70% was chosen as the target for success in this assessment. This average is substantially higher than the national success rate in lower-division chemistry classes nationwide.</p> <p>CHEM 1C: A grade of 85% was chosen as the target for success in this assessment. Students were awarded 100% when both metal ions were identified correctly. Students were awarded 85% when only one metal ion was identified correctly. Students were awarded 70% when none of the metal ions were identified correctly.</p>		
<p>CHEM_PLO_2 - Demonstrate knowledge of basic chemical concepts as well as mathematical skills as they relate to the study of chemistry. PLO Status: Active Year(s) to be Assessed: 2012-2013, 2013-2014 Outcome Creation Date: 04/23/2014</p>	<p>Exam - Course Test/Quiz - Laboratory exams from two classes, CHEM 1B (Spring 2013 and Fall 2013) were used for this assessment.</p> <p>CHEM 1B Assessment: An exam containing example data sets from the experiments conducted over the course of the quarter were administered to the students. Students were asked to complete calculations using the provided data and appropriate equations in addition to providing explanations of the chemical processes underlying the observed reactions. Two example questions are provided below:</p> <p>1) 50.0 mL of a 0.250 M</p>	<p>Program Review Reporting Year: 2015-2016 Target : Target Not Met CHEM 1B-F13: 12/9/2013, Sections 01 & 02 Number of students: 44</p> <p>CHEM 1B-Sp13: 06/24/2013, Sections 01 & 02 Number of students: 45</p> <p>Assessment data summary:</p> <p>CHEM 1B-F13: 63/100, target not met CHEM 1B-Sp13: 65/100, target not met (04/24/2014) Reflection (CLICK ON ? FOR INSTRUCTIONS): In both of the classes, the assessment demonstrated that we have fallen slightly short of our goal. While a good number of our students are achieving the target goal for demonstrating knowledge of chemical concepts and related mathematical skills, there remains work for us to do to increase their success.</p>	

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	<p>solution of sodium acetate is titrated with 0.100 M HCl. The K_a for acetic acid is 1.8×10^{-5}. (16 pts)</p> <p>a. What is the initial pH of this solution?</p> <p>b. What is the pH when 75.0 mL of HCl has been added?</p> <p>c. What is the pH at the equivalence point?</p> <p>d. What is the pH when 5.0 mL of HCl are added past the equivalence point?</p> <p>2) What happened to the solubility of $\text{Ca}(\text{OH})_2$ as the temperature decreased? Explain why this occurred in terms of ΔS and ΔH.</p> <p>Target for Success: A grade of 70% was chosen as the target for success in this assessment. This average is substantially higher than the national success rate in lower-division chemistry classes nationwide.</p>	<p>CHEM1B is the second course in our General Chemistry series and presents a large amount of material to the students that builds on the previous quarter's study. The volume of new material may be a contributing factor to failing to achieve our target assessment goal. The chemistry faculty has already taken steps to address this however, reorganizing the topics in the General Chemistry series to use 3 quarters worth of time more effectively and efficiently. In particular, one particularly large chapter on aqueous equilibria has been moved to the CHEM 1C class. This, along with some other smaller adjustments, should allow us to focus more deeply on the other material presented and help our students achieve a higher degree of mastery. Our updated course curricula go into effect in the Fall quarter of 2014.</p> <p>The assessments used to measure this program level outcome demonstrates that most students are learning chemical concepts and related mathematical relationships and are able to demonstrate these skills, but that more attention needs to be given to this area. We plan to address this by allowing increased time for in-class examples and decreasing the overall volume of material that students need to master within this single course by redistributing the total more equitably across the General Chemistry series.</p>	
<p>CHEM_PLO_4 - Demonstrate ability to acquire and analyze data through empirical observation and use of appropriate instrumentation.</p> <p>PLO Status: Active</p> <p>Year(s) to be Assessed: 2015-2016</p> <p>Outcome Creation Date: 04/23/2014</p>	<p>Laboratory Project - The average score received on the laboratory reports for a designated section will be used as the measure of success.</p> <p>Target for Success: 70%</p>	<p>Program Review Reporting Year: 2015-2016</p> <p>Target : Target Not Met</p> <p>See reflection for notes about the assessment data. (04/06/2016)</p> <p>Reflection (CLICK ON ? FOR INSTRUCTIONS): In striving to assess our PLOs, the department felt that the method chosen assessing PLO #4 – analysis of laboratory reports from Chem 12C (third-quarter organic chemistry) – did not properly address the objective, as although Chem 12C is the highest-level course the department offers, the reports generated in the class are, arguably, substantially less complicated than the reports generated in a class such as</p>	

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<p>CHEM_PLO_3 - Demonstrate basic chemical hygiene and safety in a laboratory environment PLO Status: Active Year(s) to be Assessed: 2016-2017 Outcome Creation Date: 04/06/2016</p>	<p>Exam - Course Test/Quiz - The chemistry department is currently developing an assessment that will be used to measure a student's competency in the areas of hazardous materials storage, handling, and disposal. Target for Success: 70%</p>	<p>Chem 1B (second-quarter general chemistry) or in an earlier class in the organic chemistry sequence such as Chem 12A. Additionally, the department felt that the outcome should be more focused on a key goal of the laboratory program: that students can successfully and correctly collect and interpret data, especially data obtained through the use of analytic instrumentation. Thus, the department has decided to update PLO #4 as follows: Demonstrate the ability to acquire and analyze data through empirical observation and the use of appropriate instrumentation.</p> <p>Unfortunately, the department largely failed in this assessment. The department had targeted the Fall 2015 Chem 12A course as an appropriate course upon which to base the assessment, as the instrumentation used in the course is significantly more sophisticated than that used in other courses, and the outcomes from other courses had already been adequately reflected in the other PLOs. Unfortunately, the primary piece of instrumentation used in Chem 12A, a set of infrared (IR) spectrometers, was not functional and was not repaired until the end of the quarter. This reflects an ongoing budgetary concern of the department: although we have been fortunate enough to receive significant funds through bond measures or one-time monies for the purchase of instrumentation for the courses, the department repeatedly struggles with the costs incurred by the maintenance and repair of such instrumentation. Fortunately in this instance funding was secured, so the outcome will be assessed using results from the current quarter.</p> <p>Program Review Reporting Year: 2015-2016 Target : Target Not Met Note: The previous PLO has been deactivated and replaced with the current PLO. (04/06/2016) Reflection (CLICK ON ? FOR INSTRUCTIONS): Upon reflection, the department determined the original intent of PLO #3 was already captured largely in the other objectives. Moreover, the department realized an important aspect of the program not captured in any of the</p>	

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PLOs that falls under the ICC areas of both Physical/Mental Wellness and Personal Responsibility and Civic Capacity for Global, Cultural, Social, and Environmental Justice. A crucial component of conducting chemical experiments is the ability to do so safely, following all applicable protocols for the storage, handling, and disposal of hazardous waste. Beyond the laboratory setting, it is also crucial for our students to understand the role of chemistry in everyday life, both in the way that it positively affects society through the discoveries that chemists have made but also in the way that it has harmed society through the misuse and mishandling of chemicals. Thus, the department has decided to replace PLO #3 with the following: Demonstrate basic chemical hygiene and safety in a laboratory environment.

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Dept - (PSME) Engineering

No data found for the selected criteria.

Assessment: PSME PLO Assessments (4/24/2018)



Dept - (PSME) Geology

For 2017-18 Submitted by:: Marek Cichanski

No data found for the selected criteria.

Assessment: PSME PLO Assessments (4/24/2018)



Dept - (PSME) Mathematics

For 2017-18 Submitted by:: James M. Mailhot

<i>Program Level Outcomes (PLOs)</i>	<i>Assessment Methods</i>	<i>Assessment Data Summaries</i>	<i>Enhancements</i>
<p>Mathematics PLO_2 - Demonstrate and apply a systematic and logical approach to modeling and solving mathematical problems. PLO Status: Active Year(s) to be Assessed: 2010-2011 Outcome Creation Date: 12/31/2010</p>	<p>Underlying Course - At the February 7 Math Department meeting, faculty were broken into 6 groups. Each group was assigned one of the Math Department PLO's to analyze and a spreadsheet with completed Math department assessments for an SLO that addressed PLO 2. PLO 2 was analyzed by two groups. These groups were given assessments for Math 212 SLO 1 (6 assessments); Math 10 SLO 3 (10 assessments); and Math 1B SLO 3 (4 assessments)</p> <p>Target for Success: 70% of the SLO assessments examined for PLO 2 will indicate that the target was met.</p>	<p>Program Review Reporting Year: 2014-2015 Target : Target Not Met For Math 212, 33% of the SLO 1 assessments indicated the target was met. For Math 10, 60% of the SLO 3 assessments indicated that the target was met. For Math 1B, 50% of the SLO 3 assessments indicated that the target was met. Overall, 50% of assessments examined for PLO 2 indicated that the target was met, meaning that the target was not met for PLO 2. (03/28/2014) Reflection (CLICK ON ? FOR INSTRUCTIONS): In Math 212, students seemed to perform satisfactorily when interpreting results in modeling problems, analyzing the relation between different mathematical models, and analyzing quadratic models. However, they had difficulty connecting abstract concepts in real world situations. In Math 10, students did well in the process for hypothesis testing, and did well on longer projects applying the concepts of statistics. However, they struggled in identifying the type of hypothesis test to use in a problem, had difficulty interpreting the results, and had difficulty identifying independent and dependent samples.</p>	<p>Enhancement: Some enhancements that were suggested for consideration by mathematics instructors were: Math 212: Spend more time breaking down the problem according to type of model and choose more examples of real-life situations using mathematical models. Math 1B: Do more applications and give students more in-class practice using worksheets Math 10: Provide more guidance for students on writing up their statistics projects. In general, instructors might consider daily assessments and problem solving, as well as high expectations for students. Also, it was suggested that we help students become engaged in math outside of class. The department will take these suggestions into consideration and will consider how to proceed with enhancements in a future departmental discussion. We</p>

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would hope to address the topic of enhancements during our reflection year in 2014-15. (12/19/2014)

Mathematics PLO_1 - Analyze and synthesize the concepts of mathematics from a graphical, analytical, numerical, and verbal approach.
PLO Status: Active
Year(s) to be Assessed: 2010-2011
Outcome Creation Date: 12/31/2010

Underlying Course - At the February 7 Math Department meeting, faculty were broken into 6 groups. Each group was assigned one of the Math Department PLO's to analyze and a spreadsheet with completed Math department assessments for an SLO that addressed PLO 1. PLO 1 was analyzed by two groups. These groups were given assessments for Math 114 SLO 2 (7 assessments); Math 41 SLO 1 (3 assessments); and Math 1A SLO 1 (5 assessments)

Target for Success: 70% of the SLO assessments examined for PLO 1 will indicate that the target was met.

Program Review Reporting Year: 2014-2015
Target : Target Not Met
For Math 114, 20% of the SLO 2 assessments indicated the target was met. For Math 41, 50% of the SLO 1 assessments indicated that the target was met. For Math 1A, 83.3% of the SLO 1 assessments indicated that the target was met. Overall, 54% of assessments examined for PLO 1 indicated that the target was met, meaning that the target was not met for PLO 1. However, it must be noted that for Math 1A (a major preparation course) the target percent was met with a good margin, whereas the percent of courses not achieving the target was lower (50%) for Math 41 and was very low (20%) for Math 114 (a developmental level course). (03/28/2014)

Reflection (CLICK ON ? FOR INSTRUCTIONS): In examining the reflection and analysis portion of the SLO assessments, instructors noted the following:
In Math 114, students were able to correctly do numerical calculations but when looking at cumulative material, were unable to see the difference between types of problems and when to apply appropriate rules to obtain solutions. In Math 41, students were able to use terminology correctly, could correctly explain simple concepts in words and graphically. However, they had trouble with multi-step procedures and algebraic manipulation, interpretation of graphical representations, and fundamental characteristics of functions, such as domain, range, intercepts and symmetry.
In Math 1A, students could calculate derivative analytically, but has difficulty ascertaining properties such as discontinuities and limits graphically.
Overall, students could answer questions on tests, worksheets and projects correctly or partially correctly. It was noted that students in general need a stronger foundation in algebra. A need was mentioned to

Enhancement: Suggestions pertaining to this area were to make sure that instructors address verbal or written skills as well as analytical, graphical and symbolic, when writing assessments related to this PLO. The department was unable to obtain enhancement data in time for the analysis activity. A number of instructors mentioned in their reflection and analysis sections strategies to improve student performance. These included editing project directions to make things clearer, creating projects or activities around modeling of various functions, encouraging students who felt challenged by written responses to seek help in the Language Arts tutorial center, and having students help each other with written responses. In general, instructors might consider daily assessments and problem solving, as well as high expectations for students. Also, it was suggested that we help students become engaged in math outside of class. The department will take these suggestions into consideration and will consider how to proceed with enhancements in a future departmental discussion. We

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incorporate more concrete and application examples dealing with abstract concepts. In addition, students need help in solving multi-technique problems at all levels.

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Mathematics PLO_3 - Use correct notation and mathematical precision in communicating mathematics.

PLO Status: Active

Year(s) to be Assessed: 2010-2011

Outcome Creation Date: 12/31/2010

Underlying Course - At the February 7 Math Department meeting, faculty were broken into 6 groups. Each group was assigned one of the Math Department PLO's to analyze and a spreadsheet with completed Math department assessments for an SLO that addressed PLO 3.

PLO 3 was analyzed by two groups. These groups were given assessments for Math 210 SLO 1 (3 assessments); Math 43 SLO 3 (2 assessments); Math 22 SLO 1 (2 assessments); and Math 1C SLO 1 (6 assessments)

Target for Success: 70% of the SLO assessments examined for PLO 2 will indicate that the target was met.

Program Review Reporting Year: 2013-2014

Target : Target Met

Overall, 70% of assessments examined for PLO 3 indicated that the target was met, meaning that the target was met for PLO 3. (03/28/2014)

Reflection (CLICK ON ? FOR INSTRUCTIONS): In Math 43, students were proficient in using correct notation and associated formulas for geometric and arithmetics sequences. They were also able to successfully show that for a composite functions to be one-to-one, the outer function must be one-to-one.

In Math 22, students were able to identify relevant counterexamples and comfortable show a proof of properties.

In Math 1C, students were able to correctly identify the type of sequence and match it with the correct test. It was mentioned the students at all levels are weak with prerequisite material. Basic skills students were weak overall in mathematical writing skills. Students needed more in-class practice to gain mastery in the subject material and practice use of proper notation.

Enhancement: Some enhancements that were suggested for consideration by mathematics instructors were: Instructors should do more examples using correct as well as incorrect notation. The repercussions of using incorrect notation could be discussed. In addition, students would find review modules at the beginning of the quarter useful to help them prepare for the coming topics. Finally, students would benefit from more guided practice with correct use of notation. The department will take these suggestions into consideration and will consider how to proceed with enhancements in a future departmental discussion. We would hope to address the topic of enhancements during our reflection year in 2014-15. (12/19/2014)

Assessment: PSME PLO Assessments (4/24/2018)



Dept - (PSME) Meteorology

For 2017-18 Submitted by:: Terrence Mullens

No data found for the selected criteria.

Assessment: PSME PLO Assessments (4/24/2018)



Dept - (PSME) Physics

For 2017-18 Submitted by:: David Robert Newton

No data found for the selected criteria.