

## General Education Course CGEIP Annual Report

### Title of Course Reviewed

CHM 107 - Chemistry for the Citizen

### Name of Faculty Member Preparing this Report

Gautam Bhattacharyya

### Time and Date of Course Review Meeting

9/9/2016 10:00:00 AM

### List of Participants in Course Review Meeting/Discussion

Gautam Bhattacharyya, Department of Chemistry

Bryan Breyfogle, Chair, Department of Chemistry

### Data Discussed (student work, scores, a common question, etc.); Conclusions Reached by the Previously Mentioned Participants Regarding the Next Steps for the Course

As listed in the General Education Website, General Goal 11 has 5 SLOs associated with it. Of those, I have left 11.3 for an appropriate lab-based course.

Though I have not explicitly assessed SLO 11.2: "Understand and use the processes by which knowledge of the physical world is generated," Its principles underlie the presentation of all of the content in the course. Here are the five course-specific SLOs intended to satisfy the general SLO: 1. Explain reasons for which scientists use models for their studies; 2. Recognize that all scientific models are built on sets of assumptions which determine the conditions under which the models can be used to produce scientifically-valid knowledge; 3. Explain scientific data using models; 4. Predict observable outcomes using models; and 5. Relate structure-property relationships as the basis of chemical explanations.

As taught in Fall, 2015, there were a total of 117 course-specific SLOs. Of those, 89 (76%) would be classified under SLO 11.1; 14 (12%) under 11.4; and 14 (12%) under 11.5. 17 of the 20 items in Exam 1 addressed SLO 11.1 and 3 assessed SLO 11.4. The class correctly responded to 64.4% of the SLO 11.1 items and 95.0% to the SLO 11.4. For Exam 2, 24 items addressed SLO 11.1 and only one SLO 11.4. Students correctly responded to 57.1% of the SLO 11.1 items and 44 to the single SLO 11.4. The Final Exam, the breakdown was 35 items for SLO 11.1, 8 for SLO 11.4, and 7 for SLO 11.5. Students correctly responded to 68.2 of the SLO 11.1 items, 49.6% for the SLO 11.4 items, and 45.8% for the SLO 11.5 items.

There were two main considerations for teaching CHM 107 during the Spring, 2016 semester. There needed to be a larger number of assessment items for SLOs 11.4 and 11.5. Furthermore, these items needed to be better distributed over the term. Of the 100 course-specific SLOs, 79 (79%) fit under SLO 11.1; 8 (8%) under 11.4; and 13 (13%) under 11.5. In Exam 1, students

correctly answered 71.9% of the 21 SLO 11.1 items and 55.3% of the SLO 11.4 items. For Exam 2, students correctly answered 65.8% of the 29 SLO 11.1 items and 48.2% of the one SLO 11.4 item. In Exam 3 students correctly answered 52.6% of the SLO 11.1 items, 67.6% of the 13 SLO 11.4 items, and 60.5% of the SLO 11.5 items. Lastly, on the Final Exam, students correctly answered 60.2% of the 33 SLO 11.1 items, 63.3 of the 9 SLO 11.4 items and 62.2% of the 8 SLO 11.5 items.

## Items Chosen by the Faculty for Action

The approach I took to the course during the past academic year could be described as “bottom-up” in the sense that I focused on helping students develop their chemistry content knowledge during the first two-thirds of the term. Subsequently, the goal was to help students learn to evaluate science in the media, such as the Volkswagen fraud regarding automobile emissions and the drinking-water crisis in Flint, Michigan. The rationale for this type of approach was to help students develop the scientific background necessary for making informed decisions for science-related topics and issues.

This organization, however, was a main cause behind the imbalance in the distribution of SLOs and, consequently, assessment items. Additionally, given its importance, I need to begin to assess SLO 11.2 to ensure that the students more explicitly focus on the central principles of the generation of scientific knowledge.

## Follow-up Plans and Action Regarding the Course

During the current academic year I have reversed the overall approach to the course and am using a “top-down” approach. As such, I introduce the “real-world” topic and use it to identify and teach chemistry content. This approach will help better distribute course-specific SLOs that are in the categories of SLOs 11.4 and 11.5. Finally, I intend to put in items that address SLO 11.2 (about the nature and generation of scientific knowledge) over the assessments for the course.

## General Education General Goals from the Course

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Which SLOs were assessed for this annual report?

11.1, 11.4, and 11.5

Recommendations or Feedback for the Reviewing Committee About Items that Need Action at Higher Levels than the Department or about How the Process Could Be Better Supported

None at this time

Describe Any Way Diversity Content Has Been Included in This Course