I. CHEMISTRY CURRICULAR MAPPINGS (CMs)

I. CHEMISTRY CURRICULAR MAPPINGS (CMs)

II. CHEMISTRY PROGRAM ASSESSMENTS

COLLEGE OF NATURAL AND APPLIED SCIENCES
CHEMISTRY
BACHELOR OF ARTS IN CHEMISTRY
MINOR IN CHEMISTRY
THREE-FULL-TIME FACULTY MEMBERS

CHEMISTRY DEGREE PROGRAM SLOs

CHEMISTRY CURRICULAR MAPPINGS (CMs)

CHEMISTRY/NURSING SUPPORT PROGRAM SLOs

CHEMISTRY GE CM

MINOR IN CHEMISTRY

II. CHEMISTRY PROGRAM ASSESSMENTS

ASSESSMENT ACTIVITY

ASSESSMENT RESULTS AND RECOMMENDATIONS FOR PROGRAM IMPROVEMENTS

1. CH102 and CH103: Pre-test and Post-test. Normal Test analysis using a metric adapted to assess the quantitative skills.

Assessment results show students difficulty in integrating two or more concepts for solving quantitative problems. We emphasize on quizzes as one approach that enables students to pursue lifelong learning in chemistry with the following objectives:

- Students should demonstrate adequate interpersonal communication skills.
- Students should be able to critically evaluate scientific information through oral presentations.
- Students will be able to communicate critical analysis of scientific information through written reports and qualitative approaches.
- Students should be able to describe the structure and composition of matter.
- Students should be able to interpret data and relate these to chemical structure and properties.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
- Students should be able to explain the scientific method and relate its application to chemical discoveries.
- Students should be able to apply theoretical and mechanistic principles to the study of chemical systems using quantitative and qualitative approaches.
- Students should be able to critically evaluate scientific information.
- Students should be able to develop research skills.
- Students will be able to identify, recognize and respond properly to potential hazards of handling chemicals and chemical waste.
2. The results from the pre- and post-exams for CH102 FALL 2007

a. Figure 3.0. Average scores for the pre- and post-test for CH102 students.

Figure 3.0 shows improvement in the average scores from pre-test to post-test. However, what is obvious is the low percentage in both tests. While this datum does not present a very promising learning outcome, it provides an important lesson to the assessment approach. When these tests are not administered in the middle of the semester covering the completed topics and the second at the end of semester that will cover the rest of topics, then these data should be revised. Students can review at their own pace and hence spend more time in understanding the concepts.

b. Figure 4.0 show the analysis of specific questions using the assessment rubrics. The plot shows remarkable improvement for category A but not as high for categories B and C. Category D show no improvement and overall score is also very low.

IV. ASSESSMENT RESULTS

A. Summary of Assessment Results (See below)

2. Recommendations for Improvements

b. Review syllabus and identify where more emphasis is needed;

c. Give regular quizzes to engage student on the level of requirement;

d. Split final exams into two sections. One to be administered in the middle of the semester covering the completed topics and the second at the end of semester that will cover the rest of topics;

e. Conduct assessment with American Chemical Society Standard Exam;

f. Review Record sessions on video or DVD so that students can review at their own pace and hence spend more time in understanding the concept;

g. Set up a resource center that student could access help, books, tutors, software;

h. Relate the test questions for assessment and conduct assessment.

1. The results from the pre- and post-exams for CH100 FALL 2007

a. Figure 1.0. Average score for the CH100 student at pre-test and post-test for CH100, Fall 2007:

- The results show a general improvement on student’s performance. However, the level of improvement is not so significant considering that many of them show adequate level of subject knowledge from the pre-test results of about 60%.

- The results from Figure 2.0 clearly show that students performed better under categories A and B compared to categories C and D. While post test appears to show slight improvement under categories A, B, and D there was no clear remarkable improvement for category C and D. This confirms some of our initial assumption that students have difficulty in integrating several key concepts to arrive at the final answer.

- The difficulty factor is the ratio of students who scored the correct answer in a particular question over to the total number of students. High difficulty factor scores indicate that students have better understanding and skills for solving the problem.
3. RESULT for the CH102 Pre- and Post Test FALL 2008

Figure 5.0. Average score from the Pre- and Post-test results for CH102 in Fall 2008
Results show improvement in the Post exam, similar to the Fall 2007. The percentage average is still low. This may be due to the fact that the exam was not included in the course assessment.

4. Comparison between the UOG results with the American Chemical Society National Exam for Fall 2007 and Fall 2008

Figure 7.0
Plot showing the average scores of the UOG students and the National average on the American Chemical Society National Exam. Results shows that the performance of the UOG students compares very well with the ACS results. The higher average for UOG in Fall 2007 was attributed to a number of very talented students that year.

5. Declared Majors and Credit hour production

Figure 8.0
Plot showing the trend for declared majors for Chemistry Program in comparison with Biology and Agriculture. Chemistry has remained below 10 for most years.

6.0 Regular Test Analysis for CH103

Figure 9.0
A regular exam data analyzed using the same assessment rubric. The scores were higher than the Pre- and Post-Test but they both show the same trend. Category A is the highest while category D shows the lowest score.

7.0 Credit hour Production

Figure 10.
Plot showing the trend in Credit Hour production for Chemistry Program in comparison with Biology and Agriculture.

6. Results from analysis of normal exam in the CH103

Results from analysis of normal exam in the CH103 course also show similar trends to what is shown from the CH100 and CH102 results. The students generally have low score for category D. In summary, the students generally score better in the post exam which does indicate the gaining of skills. However, the level of gain students may not be very conclusive due to the uncertainty in our methodology. Students also show difficulty in integrating and synthesizing information to solve problems. This could be due to several factors and the department will further look into some issues such as entry level of our students, content of our courses, and our delivery methods. However, based on these finding we are able to identify some key areas that could be improved in our courses (See Recommendation for Improvements in Section III above).