

July 19, 2013

1. College: **Sciences & Mathematics**
2. Department: **Chemistry & Biochemistry**
3. Course status: **existing; does not require modification**
4. Course prefix and number: **CHE 111**
5. Course title: **Introductory Chemistry (CHEM 1305); CHE 111L Introductory Chemistry Lab (CHE 1105)**
6. Course catalog description: **CHE 111 Introduction to the principles and concepts of chemical thought. Co-requisites: CHE 111L; eligibility for MTH 138. CHE 111L One semester hour, two hours lab per week. Introductory laboratory experiments. Co-requisite: CHE 111. Lab fee required.**
7. Number of semester credit hours: **4**
8. Estimated total course enrollment per year: **500**
9. Course prerequisites and/or required qualifications for enrolling in the class: **CHE 111 (3) and CHE 111L (1) are co-requisites, and eligibility for MTH 138 is a prerequisite.**
10. Course **is not/will not be** available online.
11. Foundational Component Area: **Life and Physical Sciences**
12. Explain why this course fits into this foundation component area: **Chemistry is the study of matter, and matter is anything that has mass and takes up space. Chemistry focuses on describing properties of matter, understanding and explaining principles of matter, and synthesizing the information so predictions about behavior of matter can be made. These are the essence of the scientific method and have effect mankind greatly. The impact of chemistry on humans is incalculable and includes discoveries and advances in energy, environment, forensics and medical advances.**
13. Core Objectives
 - Critical Thinking - Critical thinking is required in Introductory Chemistry in the ability to work problems and the ability to carry out laboratory exercises. Instructors in class and lab will provide students with information about critical thinking and specific instruction will be included in the CHE 111L Laboratory Manual and syllabus. During class time instructors will work problems and connect concepts as well as provide specific instruction on the thought process needed to work problems. In laboratory students will be provided instruction and will be required to demonstrate critical thinking skills by working out laboratory exercises, asking questions, reflecting on the data, and combining the information to demonstrate understanding. There will be several exercises in class as well as in lab; however, critical thinking will be specifically assessed in an experiment entitled Titration Analysis of Antacids. In the Titration Analysis of Antacids, the first question to be explored by the student will be to determine how much acid an antacid tablet will neutralize. The second question addressed will be to compare a generic antacid to a name brand antacid to determine whether or not the name brand is better than the generic. In addition, students will be provided with cost information about generic and name brand antacids and will have to assess the cost/benefit of generic versus name brand. Student's critical thinking will be assessed using a critical thinking rubric.

- Communication Skills - During the first laboratory meeting, instructors will discuss scientific communication skills. In addition, information will be provided in the CHE 111 Laboratory Manual about written and oral communication. In the lab students work in teams and will be instructed on ways to effectively communicate within the team by asking questions and listening to others so the team can function effectively. Instructors will also provide examples of appropriate scientific writing and will provide instruction on important aspects of scientific writing. While students will have multiple opportunities for written and oral communication throughout the semester, students will be assessed on their ability to demonstrate communication skills in the Titration Analysis of Antacids. Students will have to effectively discuss and communicate their finding within the group and prepare a written report that includes a summary of the experiment, data analysis which compares name brand versus generic, and articulate their group's conclusion. Student's written communication skills will be assessed by the instructor using a rubric; oral communication among the group will peer-assessed using a rubric.
- Empirical and Quantitative Skills - In class and lab multiple opportunities will be provided for students to practice empirical and quantitative skills. Several labs will require students to demonstrate their ability to manipulate and analyze numerical data collected in laboratory exercises. The Titration Analysis of Antacids will be the laboratory in which empirical and quantitative skills will be assessed. Instructors will present information about the theory of titration, demonstrate the laboratory technique of titration, and demonstrate the calculations necessary to analyze the numerical data collected. Students will then participate in the experiment, collect data, analyze the data, and draw conclusions about the effectiveness of generic versus name brand antacids. Empirical and Quantitative skills will be assessed by the instructor using a rubric.
- Teamwork - Instructors will explain the skills involved in teamwork and the importance of teamwork in chemistry and the laboratory. Students will work in teams the entire semester in the laboratory and will have gained experience in teamwork for over half the semester prior to the Titration Analysis of Antacids. Students will be provided a rubric to assess their team specifically for the Titration Analysis of Antacids.

Contact person for questions about this submission:

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