Application for General Education Credit  
for Lower Division Physical Science (Area B1)

**Course Title:** General Chemistry I  
**Course number:** CHEM 1101

Courses approved for general education credit must provide students with explicit instruction in the approved student learning outcomes. Please be as specific as possible in your explanations, describing topics, readings, assignments, activities and assessments that illustrate how the course supports students’ acquisition of the learning outcomes. Remember, there may be no one on the review committees who has any knowledge of your discipline. Attach the course syllabus and any assignments and/or assessments needed to support your explanations.

**Please use this template to address ALL of the following learning outcomes**

Purpose of Science GE: The goal of lower division general education in the natural sciences is to gain basic knowledge and learn key principles in the life and physical sciences as essential for an informed citizenry. In addition, students should recognize the experimental and empirical methodologies characteristic of science and understand the modern methods and tools used in scientific inquiry.

1. Students will demonstrate broad science content knowledge in the physical sciences such as the nature and structure of matter, Earth’s place in the Universe, or the conservation of energy and matter.

   In CHEM 1101 students gain an understanding of the nature of matter in terms of the atoms and molecules of which it is composed. They learn what situations induce changes in matter through chemical reactions and how energy is consumed or released in the process. They develop an understanding of how chemicals dissolve in water or other liquids and learn what types of chemicals make up acids and bases. Each of these concepts is addressed and reinforced through lecture explanations, demonstrations, problem solving and laboratory experimentation.

2. Students will demonstrate the application of quantitative skills (such as statistics, mathematics and the interpretation of numerical graphical data) to physical science problems.

   Chemistry requires calculations of various types, e.g. in chemical equations, solubility problems and graphical representations. The field is particularly rich in quantitative applications. Students demonstrate their acquired skills both in laboratory experiments and in several hundred problems assigned in lecture.

3. Students will demonstrate a general understanding of the nature of science, the methods applied in scientific investigations, and the value of those methods in developing a rigorous understanding of the physical world. Students should be able to identify the difference between science and other fields of knowledge. Students should be able to distinguish science from pseudoscience.

   CHEM 1101 introduces students to the scientific method. The course provides many examples of how chemical science has progressed through the process of developing hypotheses to explain chemical phenomena, then testing them rigorously before either advancing them to the level of viable theories or rejecting them as untrue. In the laboratory the students are frequently introduced to a hypothesis, given a suggested method for testing it and asked to draw their own conclusions in lab reports. They become familiar with the concept of a “controlled experiment” where all the variables are held constant except the one to be tested. The idea of rigorous and controlled testing learned in chemistry can be applied later in life when judging the likely truth of scientific claims of various types.