

Request for Courses in the Core Curriculum

Originating Department or College: **Department of Biology and Chemistry, College of Arts and Sciences**

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Course Number and Title: CHEM 1311 General Chemistry I

Please attach in separate documents:

Completed Catalog Add/Change Form

Syllabus

List the student learning outcomes for the course (Statements of what students will know and/or be able to do as a result of taking this course. See appended hints for constructing these statements.)

Student Learning Outcomes: Upon completion of the course students will be able to:

1. Discuss how scientific methods are applied in the study of science in general and chemistry in particular.
2. Classify states of matter, substances and mixture, elements and compounds, chemical symbols.
3. Apply knowledge of periodic table and compounds to predict shapes, trends, intermolecular bonding and nature of compounds.
4. Apply chemical concepts and deduce its importance to the study of chemistry.
5. Contrast the similarities and differences in chemical concepts that will be discussed.
6. Collaborate effectively on a research project and oral presentation.
7. Solve chemical problems based on formulas, concepts introduced in class and also using fundamental principles like unit conversion.
8. Communicate scientific findings, thoughts accurately and also being involved in discussions on how science and technology affects our lives daily.

Core-Curriculum Learning Outcomes:

1. Critical Thinking: includes creative thinking, innovation, inquiry and analysis, evaluation, and synthesis of information. (SLOs: 1, 3, 7)
2. Communication Skills: Students will demonstrate their ability to communicate effectively by using written communication. (SLOs: 8)
3. Empirical and Quantitative Skills: includes the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. (SLOs: 7)
4. Teamwork: includes the ability to work effectively with others to support a shared goal. (SLOs: 6)

Component Area for which the course is being proposed (check one):

- | | |
|--|---|
| <input type="checkbox"/> Communication | <input type="checkbox"/> American History |
| <input type="checkbox"/> Mathematics | <input type="checkbox"/> Government/Political Science |
| <input type="checkbox"/> Language, Philosophy, & Culture | <input type="checkbox"/> Social & Behavioral Science |
| <input type="checkbox"/> Creative Arts | <input type="checkbox"/> Component Area Option |
| <input checked="" type="checkbox"/> Life & Physical Sciences | |

Competency areas addressed by the course (refer to the appended chart for competencies that are required and optional in each component area):

- | | |
|---|--|
| <input checked="" type="checkbox"/> Critical Thinking | <input checked="" type="checkbox"/> Teamwork |
| <input checked="" type="checkbox"/> Communication Skills | <input type="checkbox"/> Personal Responsibility |
| <input type="checkbox"/> Written Communication | <input type="checkbox"/> Social Responsibility |
| <input checked="" type="checkbox"/> Oral Communication | |
| <input type="checkbox"/> Visual Communication | |
| <input checked="" type="checkbox"/> Empirical & Quantitative Skills | |

Because we will be assessing student learning outcomes across multiple core courses, assessment assigned in your course must include assessment of the core competencies. For each competency checked above, indicate the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

Critical Thinking:

Students will work in groups of 5 to design and implement an experiment testing the effects of hydrogen peroxide concentration of reaction rate using Elephant Toothpaste (Baking soda, Hydrogen peroxide and soap) with potassium iodide. The students will use their critical thinking skills to design the experimental methodology, construct a testable hypothesis and draw a conclusion supported by the collected data. A critical thinking rubric with domains for creative thinking, depth of inquiry, evaluation of importance and synthesis of information can be scored by the instructor from the lab report, or the written lab report can be uploaded for evaluation by the Core Curriculum Assessment Committee.

Communication Skills:

At the conclusion of the "Elephant Soap" experiment, students will present their findings to the class during a 10 minute presentation. The presentation will include an oral component from each group member and graphs and tables representing the data collected during the experiment. Video of the presentation can be uploaded, or the instructor can score each presenter using an oral communication rubric with domains covering grammar, organization and clarity.

Empirical & Quantitative Skills:

During the "Elephant Soap" experiment students will use their empirical and quantitative skills when they observed and calculate reaction rates, calculate the dilutions to generate different concentrations of hydrogen peroxide and use stoichiometry to calculate expected product yields. The instructor can assess the logical reasoning behind the calculation and extrapolations, or the students' answers can be uploaded for evaluation by the Core Curriculum Assessment Committee.

Teamwork:

The same "Elephant Soap" experiment can be used to assess teamwork as well. The students will be given a survey to assess their participation on the project as well as an evaluation of their each member's contribution.

Personal Responsibility:

N/A

