

## Request for Courses in the Core Curriculum

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

Person Making Request: Anju Gupta

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Course Number and Title: CHEM 1370 Survey of Chemistry

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 the conclusion of the course the students will be able to:

1. Apply the elementary concepts of chemistry and discuss how science and technology influences our daily lives.
2. Use critical thinking and the scientific method to examine chemical phenomena.
3. Collaborate effectively on a research project and oral presentation.
4. State the concept of atoms, molecules, ions, solutions and chemical reactions.
5. Explain atomic structure, bonding and intermolecular forces.
6. Solve quantitative problems involving unit conversions, chemical formulas and equations.
7. Recognize the periodic properties and trends.
8. Deduce the chemistry of acids and bases and their application in life.
9. Describe the process of oxidation and reduction reactions.
10. Name, identify, and classify various carbon compounds.
11. Distinguish the structure and properties of commonly used polymers.

**Core-Curriculum Learning Outcomes:**

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

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

Communication

Mathematics

Language, Philosophy, & Culture

Creative Arts

Life & Physical Sciences

American History

Government/Political Science

Social & Behavioral Science

Component Area Option

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 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 be assigned a "Group Research Project" during which the students will construct a 15 minute presentation on chemistry's central role in other fields of science. The students will work in groups of 5 and will choose a field of science (eg. Botany, Cell Biology) and construct a clear and convincing argument concerning chemistry's role in these fields. A critical thinking rubric with domains for creative thinking, depth of inquiry, evaluation of importance and synthesis of information can be scored during the presentation by the instructor, or the powerpoint presentations can be up loaded for evaluation by the Core Curriculum Assessment Committee.

Communication Skills:

The same "Group Research Project" can be used to assess oral communication skills as well. The 15 minute presentation will require verbal delivery of concepts by each team member. 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:

One the final exam, students will be given the question "It is suspected that a can of soda was tampered with by addition of sodium hydroxide. The concentration of  $H^+$  is determined to be 0.00094M. Does this support the suspicion of tampering by the addition of sodium hydroxide?" Students will have to write a balanced chemical equation and then calculate the number of moles and total mass of sodium hydroxide in the can. The instructor can assess the logical reasoning behind the calculation and extrapolations, or the students' answers can be up loaded for evaluation by the Core Curriculum Assessment Committee.

Teamwork:

The same "Group Research Project" 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

Social Responsibility: N/A

Will the syllabus vary across multiple sections of the course?  Yes  No

If yes, list the assignments that will be constant across the sections:

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every five (5) years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their courses.

Reviewed and approved by the Core Curriculum Committee on February 13, 2013.