How to Improve the Language of Your General Education Designation Application: College Chemistry I (CHE 131)

First Draft Language: **(Originally put forth by the Science Department in April 2012)**	*Revised Language:* **(Revised by the General Education Application Review Committee on May 3, 2012, then reviewed and resubmitted by the Chemistry subgroup and the Science Department on May 17, 2012)**

The "Notes" below each section document the discussion and thought processes by the Gen Ed Application Review Committee that went into making the revisions.

APPLICATION ITEM 3 - Course Number: CHE 131

REVISED COURSE DESCRIPTION

First Draft Language:	*Revised Language:*
Add to course description: "This course will fulfill the ISLO's for Written and Oral communication, critical thinking and Quantitative Literacy."	**Add to course description:** "This course supports the student development of Written and Oral communication, Critical Thinking and Quantitative Literacy."

Note: This revised language was developed to be used on all applications since a single course can't fulfill an ISLO – rather each course provides opportunity for further development of each ISLO. That is: "One course does not an outcome make".

APPLICATION ITEM 4 - Course Number: CHE 131

ISLO: Critical Thinking

COURSE OUTCOMES

First Draft Language:	*Revised Language:*
Students will be able to distinguish the difference between fact and theory (interpretation) as it relates to science and chemistry in particular. Students will be able to gather information, process the data and interpret the findings. Students will be "grounded" in the scientific method as it is used in science. ("Grounded" – in touch with reality, based on evidence).	Students will be able to utilize the scientific method in solving problems. Students will be able to distinguish the difference between fact and theory (interpretation) as it relates to science and chemistry in particular. Students will be able to gather information, process the data and interpret the findings.

Note: The committee felt that the scientific method statement should be the "top statement" for critical thinking as the others fall under this umbrella. The group also adopted a simpler statement for this first outcome.

LEARNING ACTIVITIES

First Draft Language:	***Revised Language:***
Examples: Formal Lab Reports that assess critical thinking. Exam questions that include having the students explain or justify their answers. Team based learning activities that ask the students open ended questions that they will discuss in a small group structure.	**Examples:** Conducting laboratory experiments and writing Formal Lab Reports that include a results and discussion section. Participating in Team Based Learning (TBL) activities that ask the students open ended questions that they will discuss in a small group structure.

Notes: The committee changed the statement that the activity (the lab report) "assesses critical thinking" and inserted a specific example of how this may be done. Remember, we're not dictating the exact format of the lab report, but rather providing a specific example to the committee as to how the lab report might assess critical thinking.
The committee also spent a significant amount of time discussing the difference between a learning activity, which is a learning experience actively performed by the student, and an artifact, which is some sort of tangible product that may be examined and assessed by the assessment people. The *process* of writing the results and discussion section is the learning activity that supports the development of critical thinking independent of the method of assessment; therefore there is no mention above of a rubric or other assessment measure. The "exam questions" statement was a better fit as an artifact, so it was moved into that category.

COURSE ARTIFACTS

First Draft Language:	***Revised Language:***
Examples Lab Reports Exams Samples of TBL activities	**Examples** Formal Lab Reports that include a results and discussion section with a rubric for assessment. Exam questions that include having the students explain or justify their answers. Documented results of TBL activities

Notes: Again, a little more detail was added to the "lab reports" statement to differentiate it from a "cookbook-type" lab that could possibly only include elementary observation. The TBL artifact statement was wordsmithed after a robust discussion by the committee of how an artifact can be obtained from a TBL activity. "Documented results of TBL activities" (that are tangible artifacts) may include written student feedback, student "score sheets", or even audio/visual recordings of the activity.

ISLO: Quantitative Literacy

COURSE OUTCOMES

First Draft Language:	*Revised Language:*
Students will be able to solve problems given quantitative information. Students should be able to accurately record and process data from a laboratory experiment. Students should be able to interpret data on graphs and tables.	Students will be able to solve chemical calculations. Students will be able to accurately record and process data from a laboratory experiment. Students will be able to interpret data on graphs and tables to understand chemical concepts.

Notes: The language change on the first statement serves to explicitly contextualize the learning outcome into chemistry. In the next statements the word "should" was changed to "will" to strengthen the statements. In the 3rd statement the added phrase helps the non-discipline committee members to understand the explicit connection to the discipline (in this case chemistry).

LEARNING ACTIVITIES

First Draft Language:	*Revised Language:*
Examples: Labs, Team Based Learning Activities, Lab Reports, Quiz and Exams. Homework	**Examples:** Conducting labs that require data acquisition Composing lab reports that require numerical or statistical analysis Completing problem sets that require calculations

Notes: The committee just made the examples more explicit in addressing the specific learning outcome. We also removed TBL since, after spending several minutes struggling with specific language, we decided that we had more than enough examples already. Once again we removed quizzes and exams from this listing since these are considered assessment artifacts not learning activities.

COURSE ARTIFACTS

First Draft Language:	*Revised Language:*
Examples: Lab Reports, Quiz, Exams Samples of TBL activities	**Examples:** Lab Reports that require numerical or statistical analysis Quizzes, Exams, or Homework sets that that require calculations

Notes: Again, the examples were just worded to add context and detail for non-discipline committee members.

ISLO: Written and Oral Communication

COURSE OUTCOMES

First Draft Language:	*Revised Language:*
Student should be able to record and process data from a laboratory experiment in a formal lab report.	Students will accurately document scientific observations in a laboratory setting.

Student should be able to present, discuss and answer questions with peers on laboratory results and/or research on a project.	Students will compose a formal lab report in a scientifically acceptable format. Student will orally present, discuss and answer questions with peers on laboratory results and/or a research project.

Notes: The committee felt it was appropriate to separate the documentation of the actual lab data and the writing of the report as 2 separate activities and therefore would be appropriate to split into separate outcomes. The 3rd statement was slightly edited to explicitly add "orally" to describe the communication.

LEARNING ACTIVITIES

First Draft Language:	***Revised Language:***
Examples: Students write formal lab reports, following a format and graded with a rubric. Students do a research project and a written report on the topic. Classroom presentations on research projects	**Examples:** Conducting labs that require documentation of scientific observations Writing formal lab reports that follow a scientifically acceptable format Delivering classroom presentations or writing reports on research projects

Notes: The activities per se don't mention the rubrics for grading (for reasons discussed earlier), which are included in the artifacts section.

COURSE ARTIFACTS

First Draft Language:	***Revised Language:***
Examples: lab reports assessed with a rubric. Research projects assessed with a rubric Classroom presentations Student reflection assignments	**Examples:** Formal lab reports that follow a scientifically acceptable format assessed with a rubric. Products of research projects (ie posters, papers, audio/visual recordings) assessed with a rubric Audio or video recordings of student presentations Student reflection assignments and/or essays Juried presentation (where students orally present their findings or work to an audience in the presence of an ISLO assessment team)

Note: The science faculty who worked on this included the type of writing that could occur on exams – such as essay questions – in the 4th artifact statement. Though this type of writing is less prevalent in chemistry than other science courses, it was felt that as a "model document" this language might help our colleagues in Bio, A&P, and other science areas with their future applications.