Chemistry Undergraduate Student Writing Outcomes

Academic year

1. Freshman (general: CHM 2045/2046/L)
2. Sophomore (organic: CHM 2210/2211/L)
3. Junior (analytical: CHM3120/L; physical: CHM 3410/3411/L)
4. Senior (biochem: BCH 4053; advanced anaytical: CHM 4130/L; inorganic: CHM 4610/L, seminar)

Bloom's Taxonomy	Students should be able to:	Activity	Academic year
1. Knowledge: rote memorization, recognition, or recall of facts (recite, recall, identify, define)	Demonstrate appropriate use of organization and grammar to communicate scientific knowledge through writing.	In class writing Lab report Research report	1, 2, 3, 4
	Use scientific vocabulary appropriate for different purposes and audiences.	In class writing	1, 2, 3, 4
2. Comprehension: understanding what the facts mean (describe, explain, summarize, interpret, discuss)	Communicate scientific theories and concepts in written format to both scientists and nonscientists.	In class writing Lab report Research report	1, 2, 3, 4
	Summarize an experiment and motivation behind it.	Lab report	1, 2, 3, 4
	Accurately detail the progress made in an experiment or project by presenting the experimental procedures and data in a way that is accurate and appropriate to the audience.	Lab report Research report	1, 2, 3, 4
	Effectively summarize source materials and form argument for a claim or a proposed action based on source materials.	Literature review	2, 3, 4

3. Application: correct use of the facts, rules, or ideas (calculate, predict, apply, solve, determine)	Apply chemistry concepts and principles to a variety of real-life situations.	In class writing Lab report	1, 2, 3, 4
	Locate, apply, and cite effective secondary materials in their own texts.	Lab report	1, 2, 3, 4
4. Analysis: breaking down information into component parts (outline, categorize, analyze, diagram, illustrate)	Use writing as a mechanism to develop critical thinking.	In class writing Lab report (Ask pertinent and productive questions that lead to an analysis of a problem, the source of the problem, the kinds of data needed to solve the problem, and the criteria that must be met for a solution to the problem.)	1, 2, 3, 4
	Distinguish between types of source materials (peer reviewed primary literature, reviews, popular press, etc).	Literature review	3, 4
	Make a logic and clear conclusion based on data and/or evidence.	Lab report Research report	1, 2, 3, 4
	Demonstrate in-depth knowledge and understanding of chemistry concepts through writing.		2, 3, 4
	Become adept at the iterative process of writing and revision.	Lab report Research report	3, 4
	Identify the audience of their writing and produce genre specific writing.		3, 4

6. Evaluation: judge the value or worth of information or ideas (support, relate, compare, contrast, justify, convince, evaluate)	Assess the writing of others.	Peer review Written evaluations showing understanding of the reading, credibility of the authors, motivations for the project and recommendations for further actions	1,2, 3, 4
	Evaluate data for relevance and credibility.	Peer review Literature review Research report	1, 2, 3, 4
	Justify they importance of scientific theories and concepts.	Research report	3, 4
	Evaluate articles about science in their discipline from a popular and scholarly press by analyzing claims, arbitrating among conflicting claims, and recognizing when data confirm or disconfirm hypotheses.	Literature review	3, 4