Course Outcomes Guide (COG)

Directions: Please complete this form to document your progress toward improving student learning. For each item, indicate your progress and your anticipated next steps. Thank you!

Course Title: CHM 103 **Date: May 2014**

Course Team: Veronica Stein, Chris Nelling

Expected Learning Outcomes

1. Apply quantitative thinking processes and reasoning skills to physical laws, stoichiometry, and atomic and molecular structure.
2. Communicate core course concepts in writing while using appropriate technology
3. Solve quantitative chemistry problems and demonstrate reasoning clearly and completely. Integrate multiple ideas in the problem solving process. Check results to make sure they are physically reasonable.
4. Collect, analyze, and evaluate empirical data to substantiate chemical concepts.
5. Relate chemical concepts to real life scenarios

Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

- Online Homework using MasteringChemistry
- A Nationalized Final Exam written by the American Chemical Society (ACS) for the first semester of General Chemistry is used as the final exam for CHM 103.

Validation (What methods have you used or will you use to validate your assessment?)

We compare our students to the national average of the ACS exam.

Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

Our students typically achieve the mean or higher for the national ACS exam in the last two years.

CHM 103		
Semester	n	mean
05/FA	51	33.7
06/SP	13	36,5
06/SU	5	56.4

CHM 103			
06/FA	42	42.5	
07/SP	21	37.6	
07/SU	7	42.57	
07/FA	53	38.21	
08/SP	19	40.05	
08/SU	7	43.29	
08/FA	54	42.67	
09/SP	25	39.08	
09/Su	11	38.73	
National 2002 version	2616 from 32 colleges	41.03	out of 70 questions

CHM 103			
Semester	n	mean	
09/FA	58	41.1	
10/SP	23	34.6	
10/SU	10	46.7	
10/FA	74	39.8	
11/SP	31	35.7	
11/SU	23	41.0	
11/FA	52	40.9	
12/SP	34	37.1	
12/SU	18	37.6	
12/FA	51	41.7	
13/SP	27	33.1	
13/SU	19	35.79	
13/FA	57	42.28	
14/SP	22	33.82	
National 2009 version	3827 from 34 colleges	37.13	out of 70 questions

Follow-up (How have you used or how will you use the data to improve student learning?)

In addition to determining the average, we perform an item analysis on the questions. From the item analysis, topic areas which are weak are determined and address in changing lecture material or lab experiments to better cover these concept.

Current areas of weakness gauged by the %group total are

Fall 2013

- Naming compounds
- Visual macroscopic concept of chemical reactions
- Energy involved with electronic transitions

Spring 2014

- Naming compounds
- Unit conversions

Visual macroscopic concept of chemical reactions
Bond energies
Heat of formation reactions
Determining heat of reactions using bond energies
Energy involved with electronic transitions
Bond angles
Sigma and pi bonds
Resonance

Budget Justification (What resources are necessary to improve student learning?)
Purchase the latest version of ACS exams, which would be v2012.

Course: CHM 103 **SLOA Data** **Faculty Team: V Stein**

	SU 2009	FA 2009	SP 2010	SU 2010	FA 2010	SP 2011	SU 2011	FA 2011	SP 2012	SU 2012	FA 2012	SP 2013
# Active students	13	74	30	17	93	37	24	75	39	19	80	45
%W	7.7%	9.5%	13.3%	23.5%	10.8%	8.1%	0%	17.3%	10.3%		25.9*	
*% walk-away Fs No final exam/grade = F	0%	8.1%	7.7%	15.4%	7.2%	8.8%	4.2%	8.1%	2.9%		13.3*	
% Success (A,B,C)	66.7%	59.2%	75.9%	37.5%	63.3%	59.5%	87.5%	55.7%	66.7%	73.7%	50.6%	75.0%
Mean Common Lab Practical Score												
Common Comprehensive Final Exam Score	38.7	41.1	34.6	46.7	39.8	35.7	41.0	40.9	37.1	37.6	41.7	34.06
Mean course grade	2.09	1.91	2.64	2.17	2.04	2.12	2.17	2.07	2.46	2.37	1.97	2.33
Gen Ed Assessment Score											5.94/8	7.3/10
Item Analysis **Weakest Content Areas**											*	**

*% Walk-away Fs = Did not take the final exam and received a grade of F.

Content Areas

Fall 2012: Naming molecular compounds, visualizing chemical reactions, electron transitions and energy

**Spring 2013: Naming molecular compounds, unit conversions, oxidation numbers, electron transitions and energy, ionization energies, molecular geometry

Course: CHM 103 **SLOA Data** **Faculty Team: V Stein**

	SU 2013	FA 2013	SP 2014	SU 2014	FA 2014	SP 2015	SU 2015	FA 2015	SP 2016	SU 2016	FA 2016	SP 2017
# Active students	19	58	22									
%W		20.5										
*% walk-away Fs No final exam/grade = F		1.7										
% Success (A,B,C)		69.0										
Mean Common Lab Practical Score												
Common Comprehensive Final Exam Score	35.8	42.3	33.8									
Mean course grade												
Gen Ed Assessment Score	7.74/10	8.61/10	7.59/10									
Item Analysis **Weakest Content Areas**	*											

*% Walk-away Fs = Did not take the final exam and received a grade of F.

Content Areas

*Fall 2013: Naming molecular compounds, visualizing chemical reactions, electron transitions and energy, bond energies and heats of reactions

*Spring 2014: Naming molecular compounds, unit conversions, visualizing chemical reactions, bond energies, heat of formation reactions determining heat of reactions using bond energies, electron transitions and energy, bond angles, sigma and pi bonds, resonance.