Framingham State University

Program Assessment Plan for Chemistry 2014-2019

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1) PROGRAM MISSION STATEMENT (and goals)

The Department of Chemistry and Food Science at Framingham State University is committed to providing our graduates with a comprehensive undergraduate education in chemistry incorporating the sub-disciplines of analytical, biochemistry, inorganic, organic, and physical chemistry. We strive to engage and challenge students within our courses and laboratories. We promote active participation, foster critical thinking, and address safety and ethical issues.

2) PROGRAM LEARNING OBJECTIVES

Objective 1: Demonstrate an understanding of the key concepts of the traditional areas of chemistry

Objective 2: Communicate complex technical information in written and/or oral formats

Objective 3: Interpret and draw conclusions from experimental data

Objective 4: Demonstrate safe lab practices

Objective 5: Retrieve chemical information from the chemical literature, books, and data bases.

3) LEARNING OPPORTUNITIES

Chemistry													
Program Learning Objectives		*CHEM 107*	*CHEM 108*	*CHEM 207*	*CHEM 208*	*CHEM 301*	*CHEM 303*	*CHEM 304*	*CHEM 321*	*CHEM 332*	*CHEM 401*	*CHEM 497*	*CHEM 498*
Content Knowledge													
PLO 1	*Demonstrate an understanding of the key concepts*	*I*	*I*	*I/R*	*R*	*I*	*E*	*R*	*E*	*E*	*E*	*E*	*E*
PLO2	*Communicate complex technical information*	*I*	*I*	*R*	*R*	*E*	*E*	*E*	*R*	*E*	*R*	*R*	*E*
PLO3	*Interpret and draw conclusions from experimental data*	*I*	*I*	*R*	*R*	*R*	*E*	*E*	*E*	*E*	*E*	*E*	*E*
PLO4	*Demonstrate safe lab practices*	*I*	*I*	*R*	*R*	*R*	*R*	*R*	*R*	*R*	*R*	*E*	*E*
PLO5	*Retrieve chemical information*				*I*	*I*	*I*	*R*	*R*	*R*	*R*	*E*	*E*

I = Introduced
R = Reinforced
E = Emphasized

Course Code Key

CHEM 107 Principles of Chemistry
CHEM 108 Principles of Chemistry and Quantitative Analysis
CHEM 207 Organic Chemistry I
CHEM 208 Organic Chemistry II
CHEM 301 Biochemistry I
CHEM 303 Physical Chemistry I
CHEM 304 Physical Chemistry II
CHEM 321 Instrumental Analysis
CHEM 332 Biochemistry II
CHEM 401 Inorganic Chemistry
CHEM 497 Chemical Research I
CHEM 498 Chemical Research II

4) ASSESSMENT METHODS AND TIMELINE

Academic Years	Outcome(s)	Course(s)	Assessment Evidence (direct/indirect)	Assessment Method	Responsibility
WHEN	WHICH outcome(s) will you examine in each period (Use number)?	WHERE will you look for evidence of student learning (i.e., list course(s) that will generate evidence for each objective.	WHAT student work or other evidence will you examine in order to assess each objective?	HOW will you look at the evidence; what means will you use to analyze the evidence collected for each objective	WHO will oversee collecting, analyzing, reporting, results? List names or titles.
Year 1 (14/15)	PLO2 Communicate (collect)	CHEM 498	Senior thesis	Summative: The senior theses from students completing CHEM 498 from the previous three academic years will be analyzed. (Develop/Pilot Rubric)	Departmental committee
	PLO3 Interpret (collect)	CHEM 108 CHEM 321 CHEM 498	Lab practical exam Senior thesis	Pre/Post: The lab practical from CHEM 108 will be administered in CHEM 321. Pre/Post data will be assessed using a rubric developed by the department. Summative: CHEM 498 The senior theses from students completing CHEM 498 from the previous three academic years will be analyzed. (Develop/Pilot Rubric)	CHEM 108: Catherine Dignam CHEM 498: Departmental Committee
	PLO5 Literature (collect)	CHEM 498	Senior thesis	Summative: CHEM 498 The senior theses from students completing CHEM 498 from the previous three academic years will be analyzed. (Develop/Pilot Rubric)	CHEM 498: Departmental Committee

Year 2 (15/16)	PLO1 Key Concepts (collect)	Outside course meeting	Departmentally generated exit examination	Summative: The department will administer an exit examination to graduating seniors at the end of the academic year.	Departmental Committee
	PLO4 Safe lab practices (collect)	Outside course meeting	Departmentally generated exit examination	Summative: The department will administer an exit examination to graduating seniors at the end of the academic year.	Departmental Committee
Year 3 (16/17)	PLO1 Key Concepts (collect)	CHEM 108 CHEM 208 CHEM 321	ACS subject exams for general chemistry, organic chemistry, and instrumental analysis	Formative Assessments of content knowledge based on raw score. These data will be compared to the national norms provided by the ACS.	CHEM 108 – Sarah Pilkenton CHEM 208 – Shelli Waetzig CHEM 321 – Sarah Pilkenton
Year 4 (17/18)	PLO2 Communicate (assess)	CHEM 498	Senior thesis	Summative: The senior theses from students completing CHEM 498 from the previous three academic years will be analyzed.	Departmental committee
	PLO3 Interpret (assess)	CHEM 108 CHEM 498	Lab practical exam Senior thesis	Pre/Post: The lab practical from CHEM 108 will be administered in CHEM 321. Pre/Post data will be assessed using a rubric developed by the department. Summative: CHEM 498 The senior theses from students completing CHEM 498 from the previous three academic years will be analyzed.	CHEM 108: Catherine Dignam CHEM 498: Departmental Committee
	PLO5 Literature (assess)	CHEM 498	Senior thesis	Summative: CHEM 498 The senior theses from students completing CHEM 498 from the previous three academic years will be analyzed.	CHEM 498: Departmental Committee

Year 5 (18/19)	PLO1 Key Concepts (assess)	CHEM 108 CHEM 208 CHEM 321	ACS subject exams for general chemistry, organic chemistry, and instrumental analysis	Formative Assessments of content knowledge based on raw score. These data will be compared to the national norms provided by the ACS.	CHEM 108 – Sarah Pilkenton CHEM 208 – Shelli Waetzig CHEM 321 – Sarah Pilkenton
	PLO1 Key Concepts (assess)	Outside course meeting	Departmentally generated exit examination	Summative: The department will administer an exit examination to graduating seniors at the end of the academic year.	Departmental Committee
	PLO4 Safe lab practices (assess)	Outside course meeting	Departmentally generated exit examination	Summative: The department will administer an exit examination to graduating seniors at the end of the academic year.	Departmental Committee

Program Size and Sampling Technique

a. State the number of students in the program or the number who graduate each year.

   Approximately 10 students graduate with a chemistry major each year. As of October 2014, there are a total of 45 chemistry majors in the three concentrations of chemistry distributed among the four year program.

b. Describe the sampling technique to be used.

   Data will be collected for all chemistry majors each academic year and evaluated in aggregate as indicated in the assessment timeline. In this five year assessment plan, artifacts will be collected during years one, two, and three, and these artifacts will be assessed during years four and five.

5) PLAN FOR ANALYZING RESULTS

- List who is responsible for distributing results and who will receive results?

  Formative assessments will be collected and analyzed by course instructors and/or course coordinators. Summative assessments will be collected and analyzed by the department assessment committee. The results will be shared with all full-time tenure/tenure track faculty and will be stored in the department chair's office.

- State how and at which forums discussion of results will take place.

  Discussion of the results will take place during the department's annual retreat.

6) DISTRIBUTION. The program will distribute or publish these items in the following ways:

ITEM	***Distribution Method***					
	FSU Catalog (provide section title)	**Website** (provide URL)	**Annual Reports**	**Brochures**	**Course Syllabi**	**Other** (please describe, e.g. department meeting, advising session)
Program Mission	X	X (http://www.framingham.edu/chemistry/index.html)	X		X	Department meetings and annual retreat, advising session
Program Learning Objectives		X (http://www.framingham.edu/chemistry/index.html)	X		X	Department meetings and annual retreat, advising session
Learning Opportunities (Curriculum Map)		X (http://www.framingham.edu/chemistry/index.html)	X		X	Department meetings and annual retreat, advising session
Assessment Plan		X (http://www.framingham.edu/chemistry/index.html)	X		X	Department meetings and annual retreat, advising session

[1] If you have questions or need assistance, please contact Dr. Mark Nicholas, Director of Assessment at mnicholas1@framingham.edu or 508-626-4670

[2]Accredited programs can provide supplemental documents that indicate the answers to these questions as long as specific page references are provided in each cell of the tables in this form. When the answers are not accessible in that way, please cut and paste into your assessment plan.

[3]This template was developed using ideas from templates developed at the University of Rhode Island and the University of Hawaii in Manoa.